



Planning and Assistance Division

GENERAL BASIN MAP LOWER PLATTE RIVER BASIN



DRAFT

Explanation

Lower Platte Basin

Lakes

Cultural Features

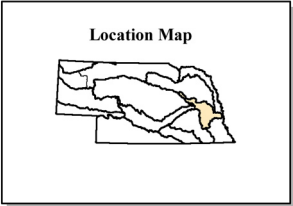
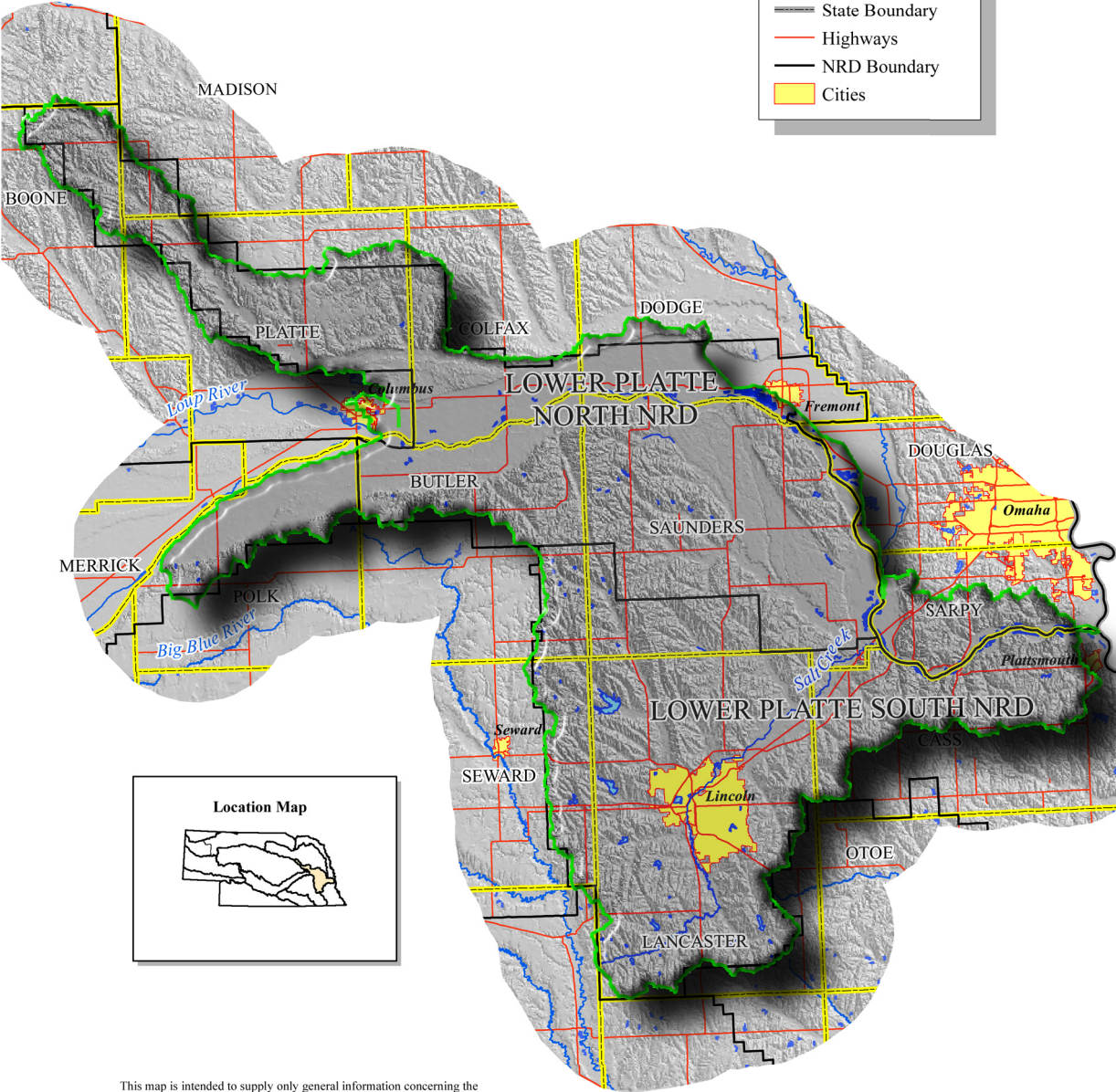
County Boundary

State Boundary

Highways

NRD Boundary

Cities



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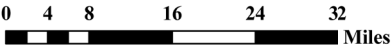


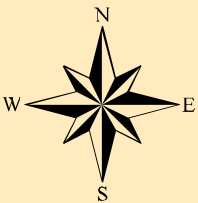
Figure LP-1.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
General basin map produced by Shuhai Zheng, October 11, 2005.

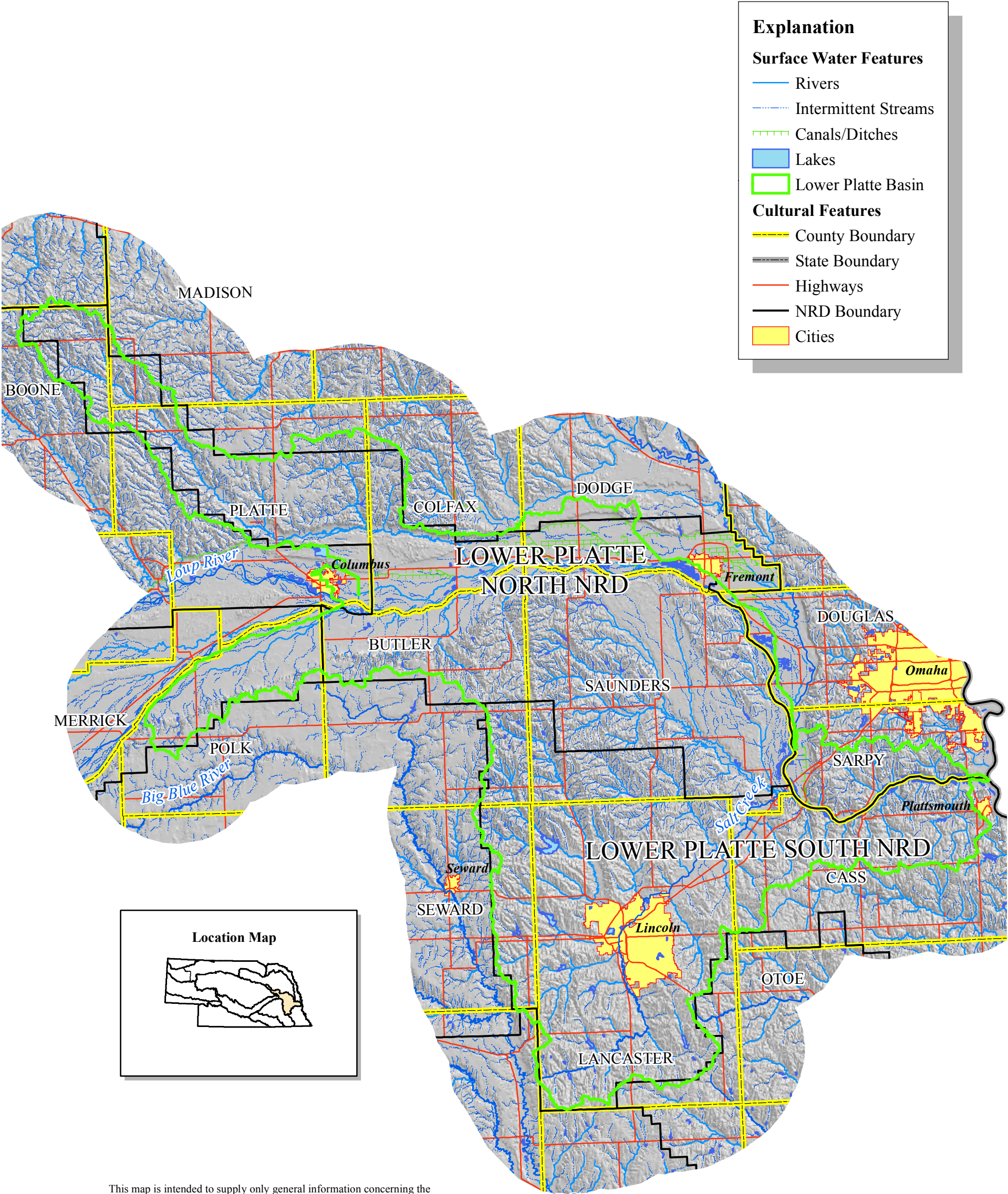


General Surface Water Features

LOWER PLATTE RIVER BASIN



Planning and Assistance Division



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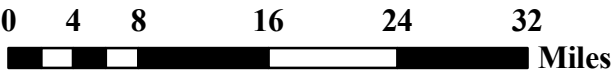


Figure LP-2.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
General surface water features map produced by Shuhai Zheng, October 11, 2005.



Planning and Assistance Division

Precipitation Gages

LOWER PLATTE RIVER BASIN

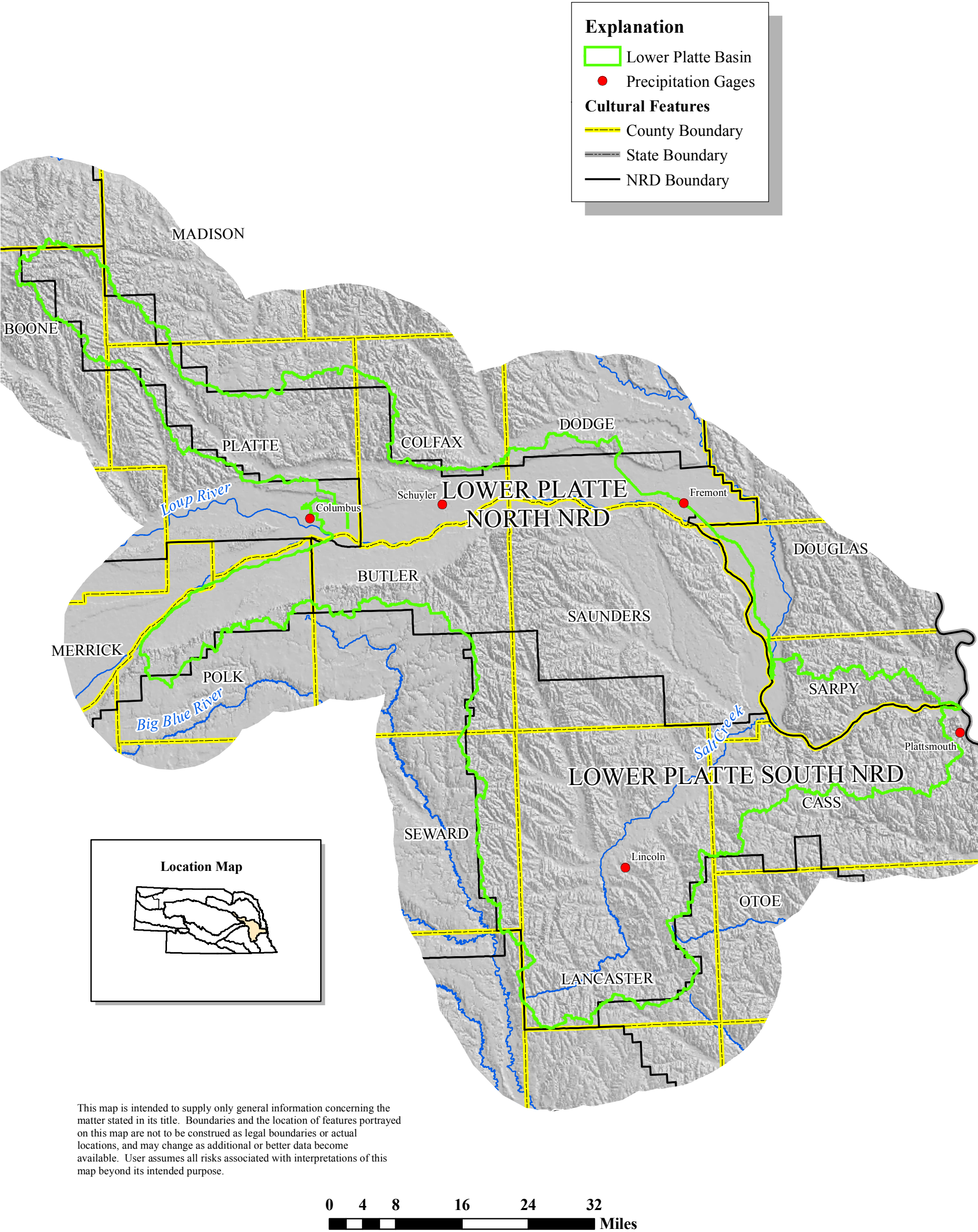
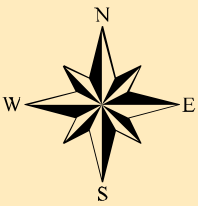


Figure LP-3.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Precipitation gages map produced by Jeff Shafer, October 19, 2005.

Figure LP-4. Annual Precipitation at Columbus.

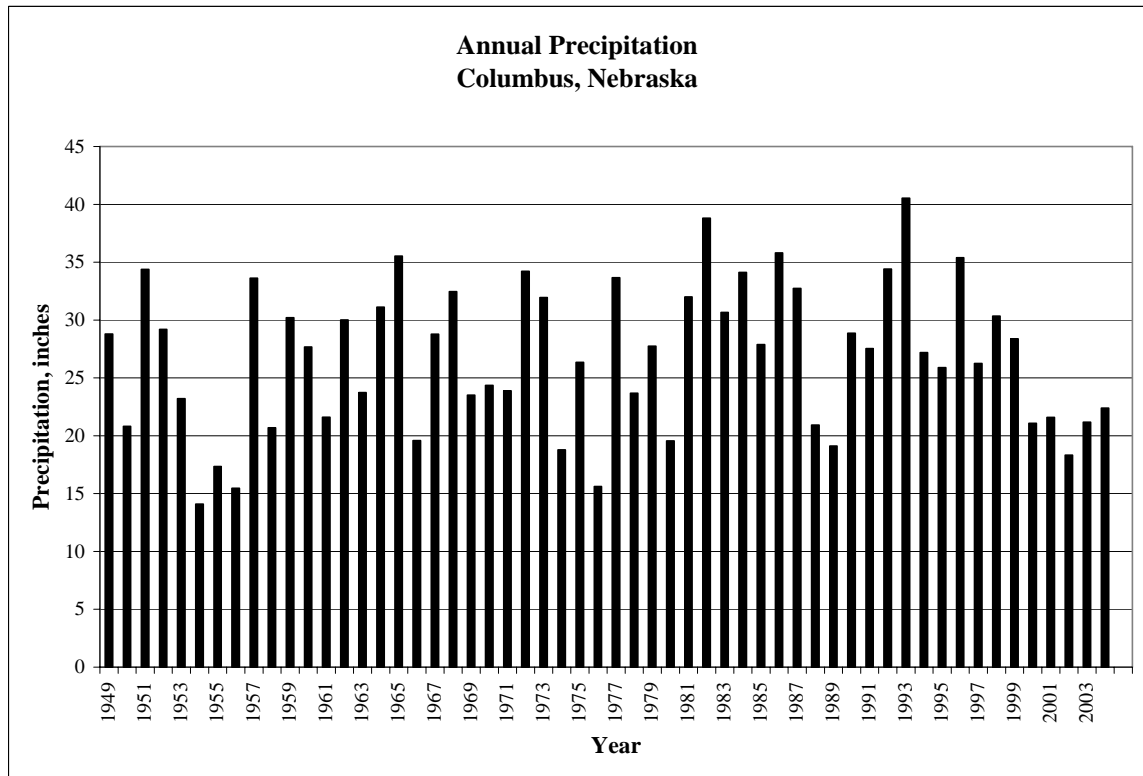


Figure LP-5. Growing Season (May-September) Precipitation at Columbus.

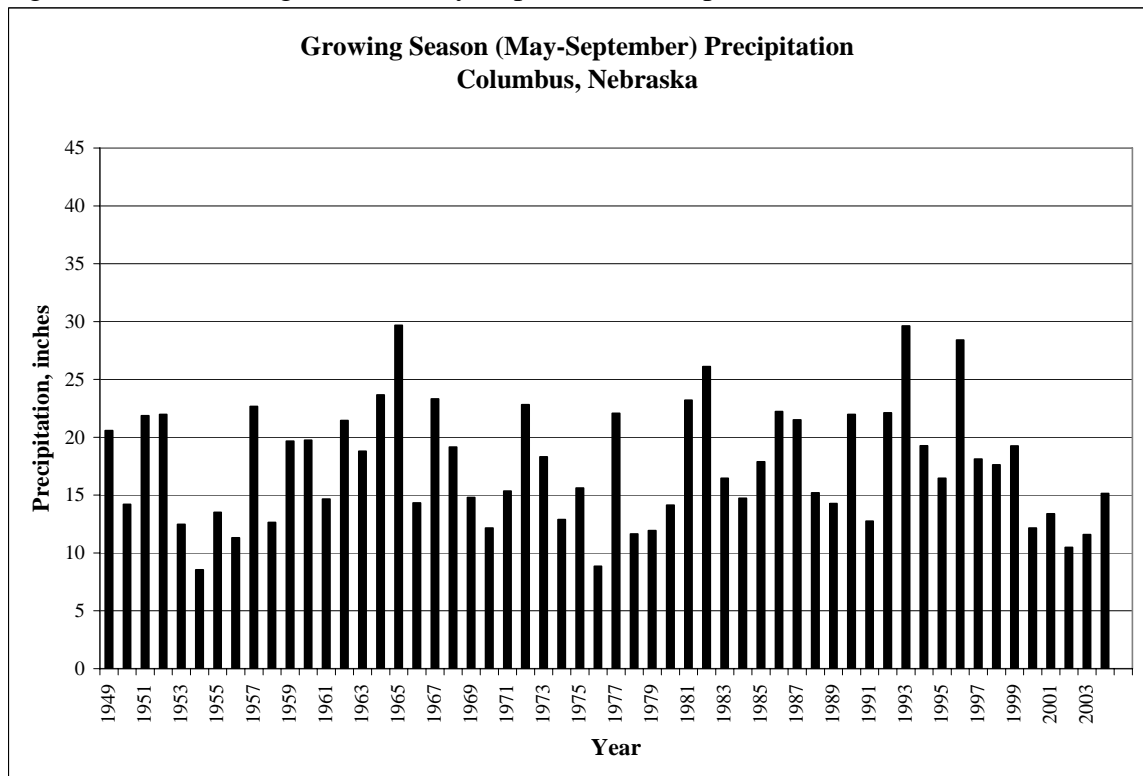


Figure LP-6. Annual Precipitation at Fremont.

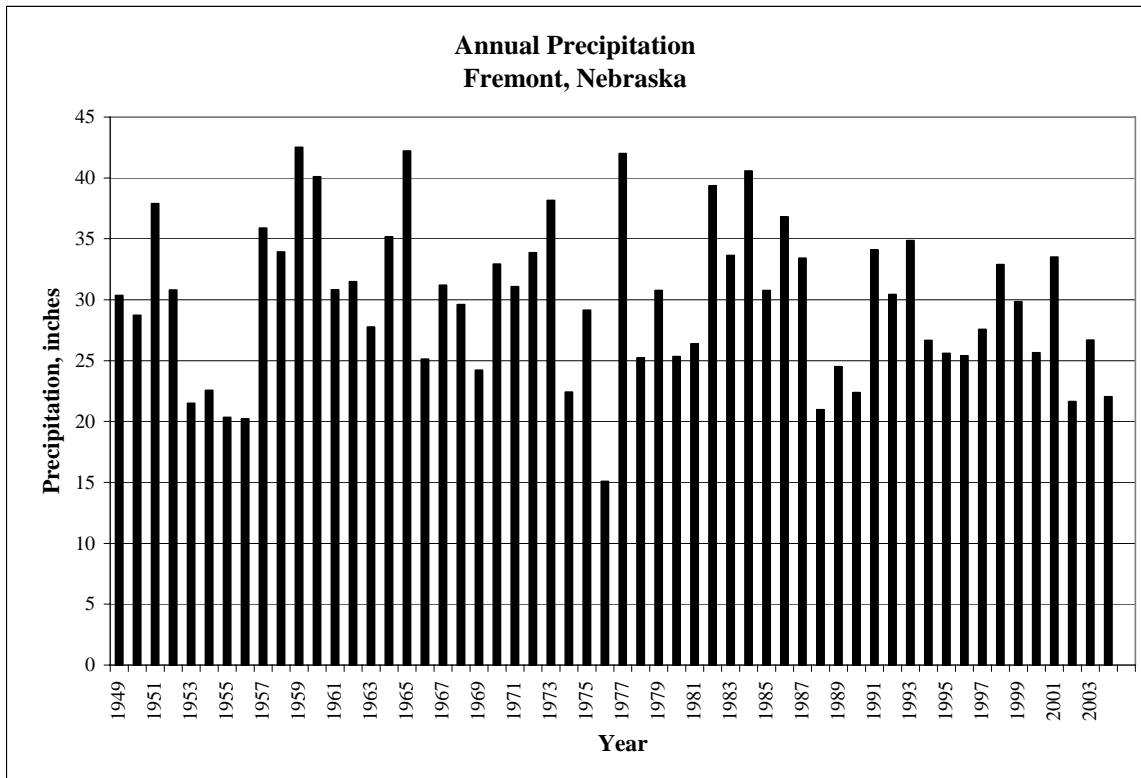


Figure LP-7. Growing Season (May-September) Precipitation at Fremont.

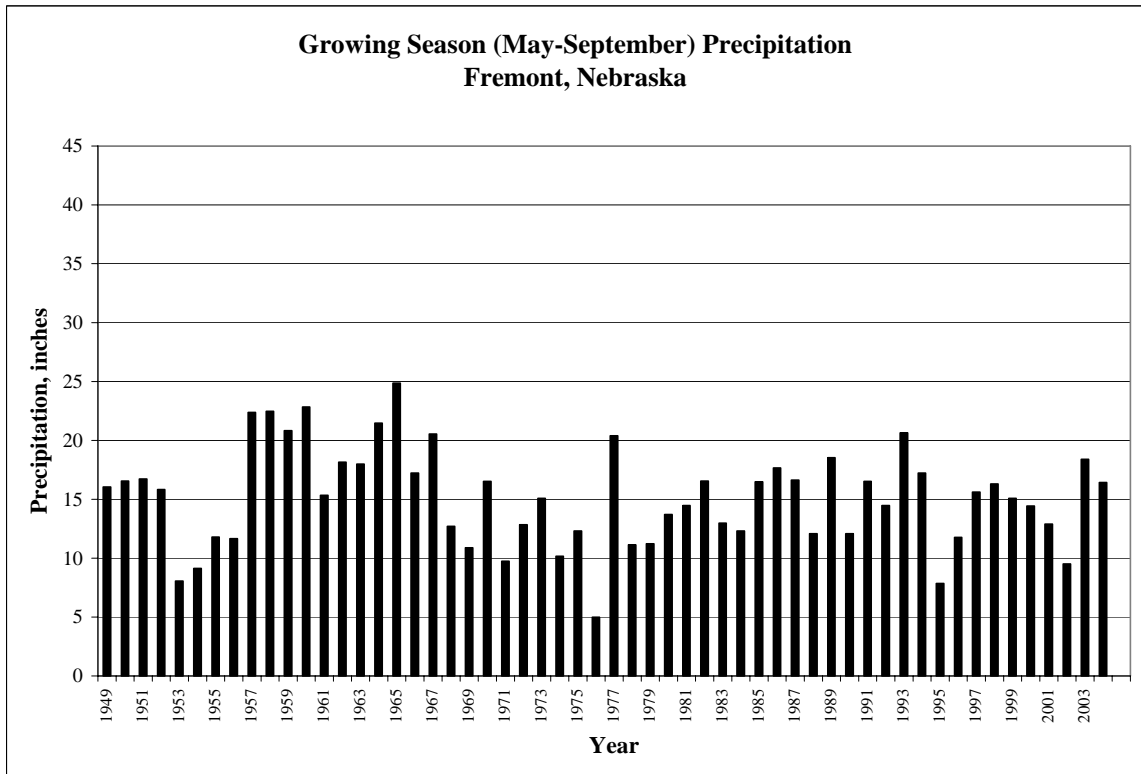


Figure LP-8. Annual Precipitation at Lincoln.

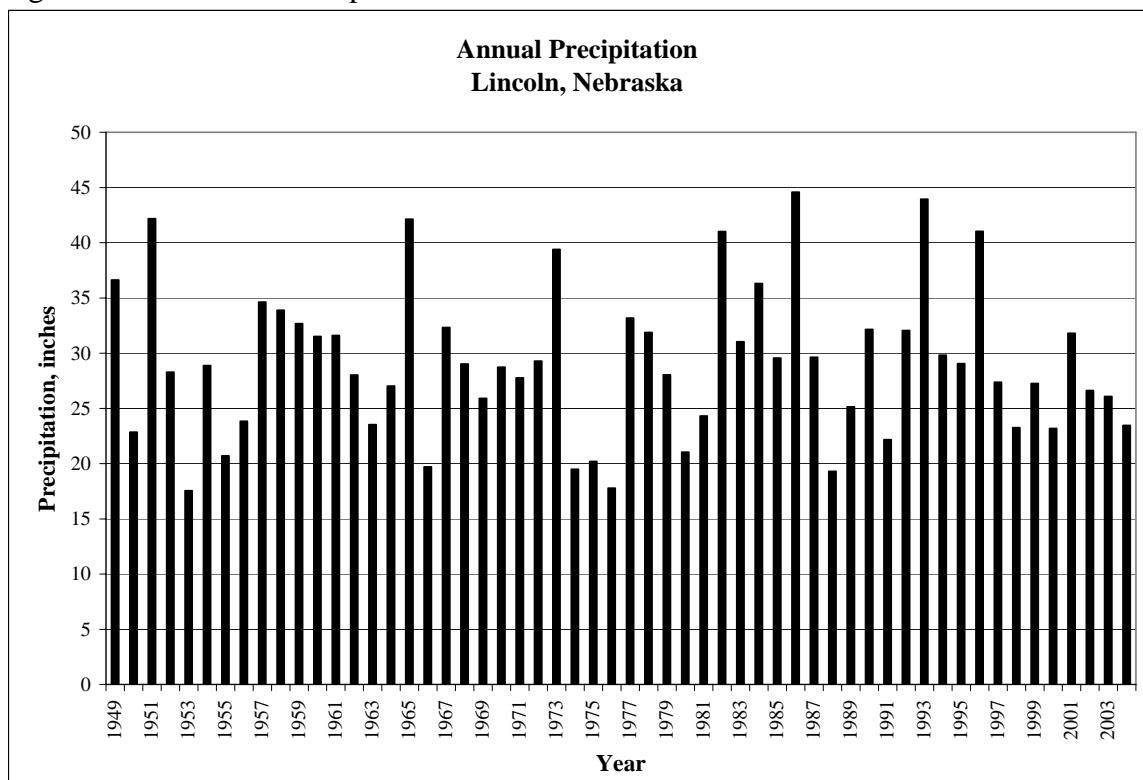


Figure LP-9. Growing Season (May-September) Precipitation at Lincoln.

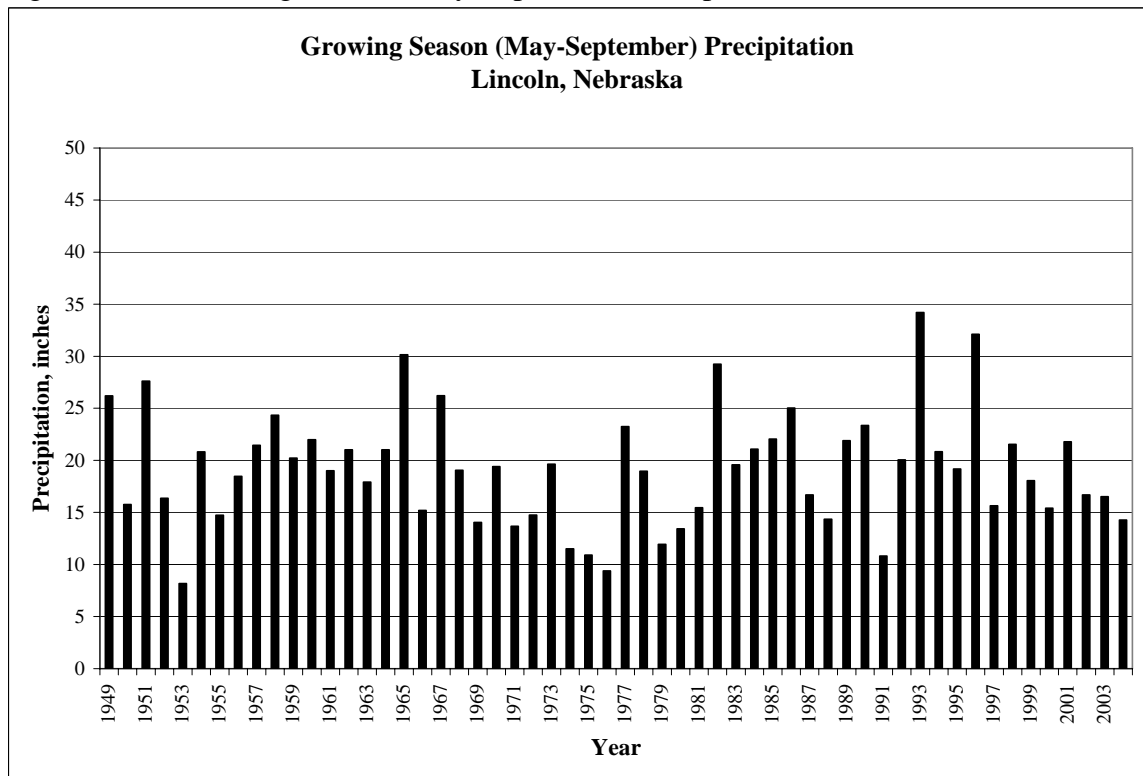


Figure LP-10. Annual Precipitation at Plattsmouth.

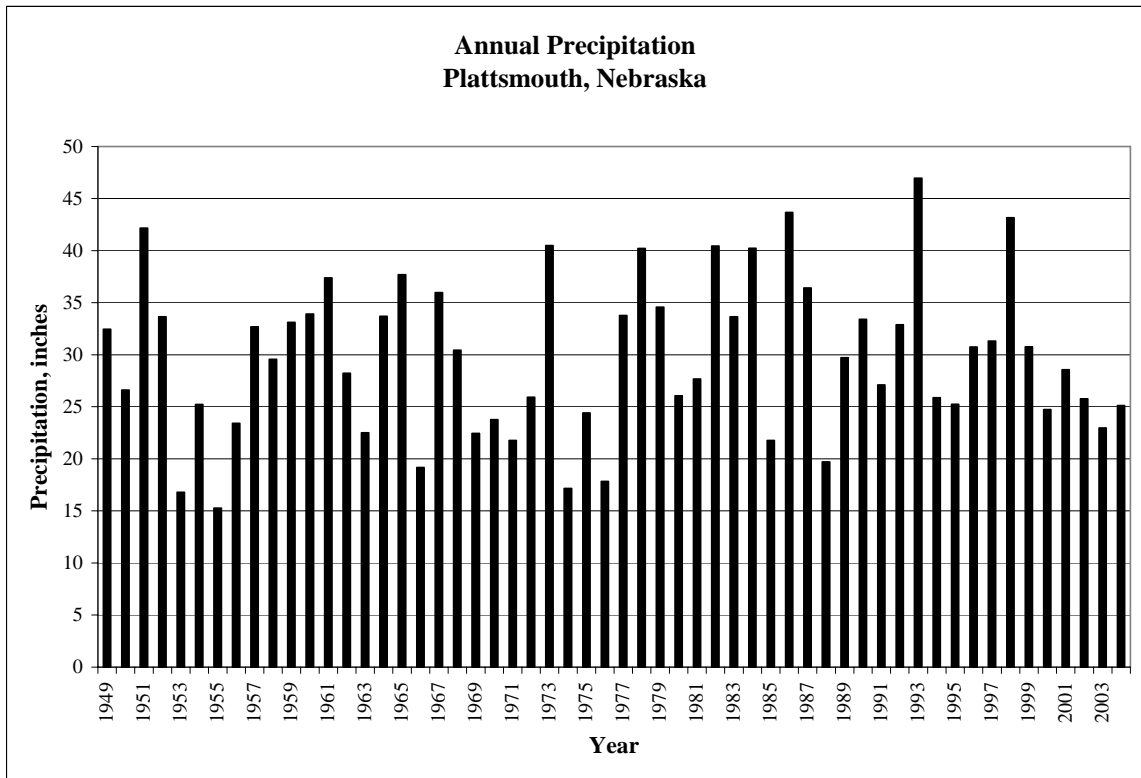


Figure LP-11. Growing Season (May-September) Precipitation at Plattsmouth.

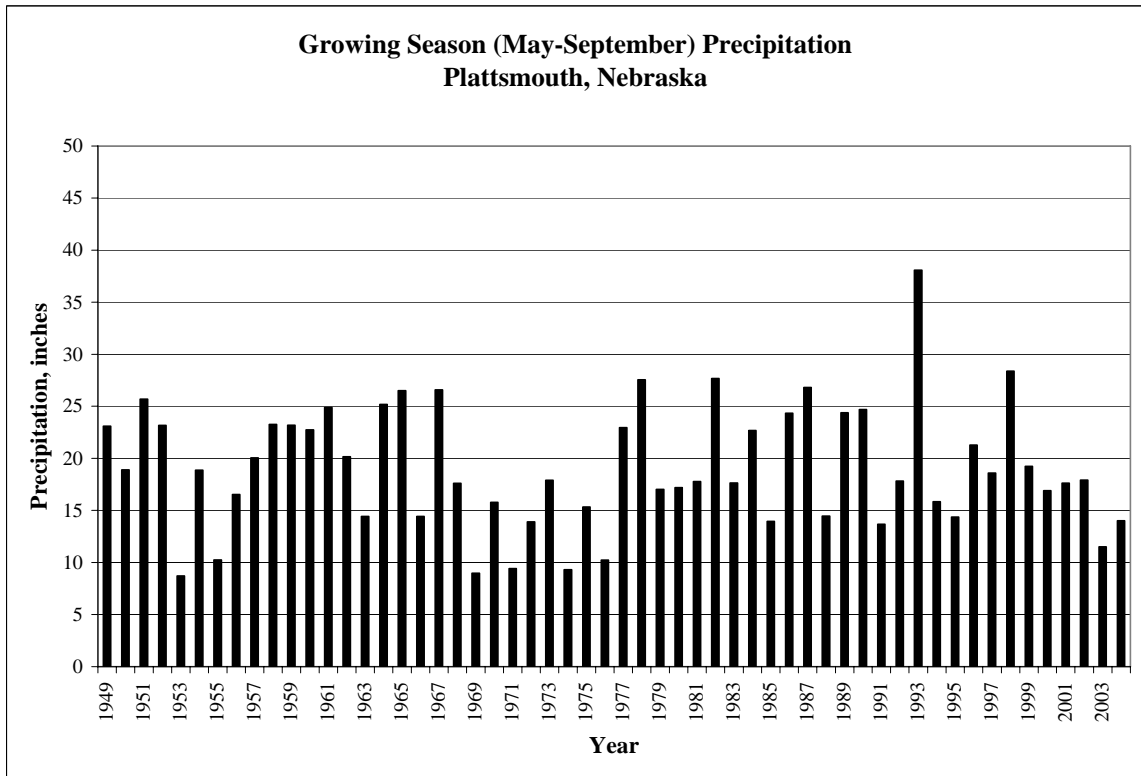


Figure LP-12. Annual Precipitation at Schuyler.

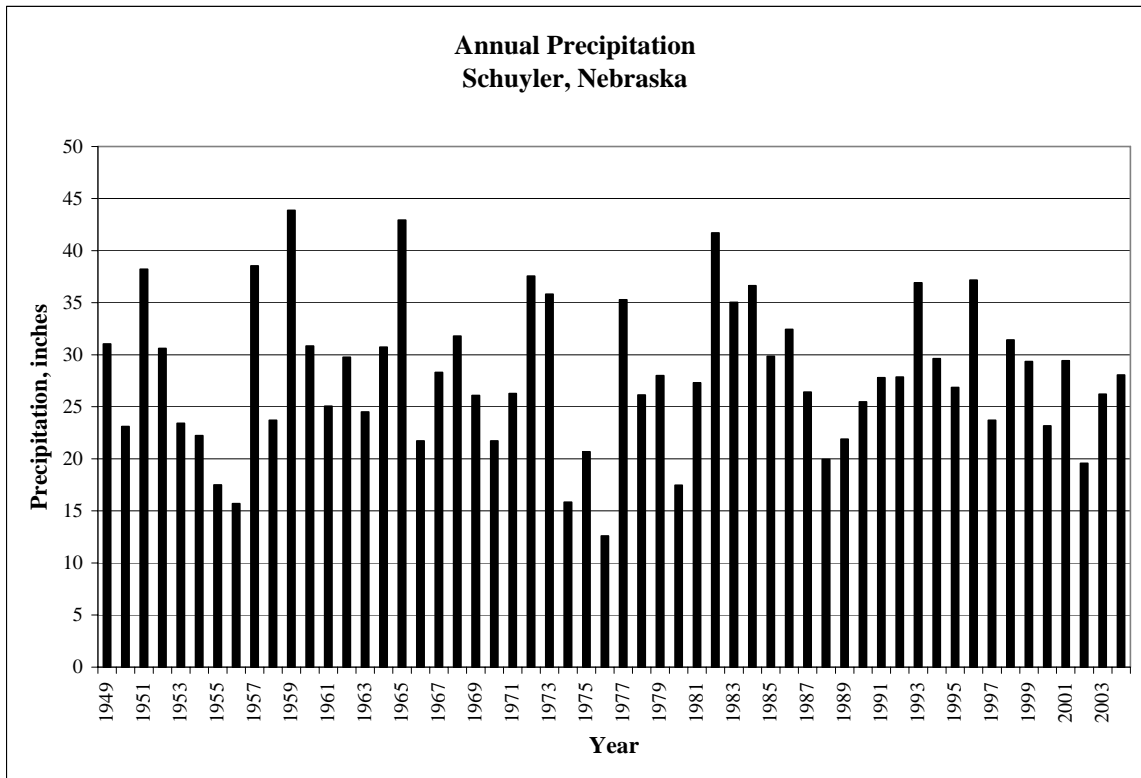
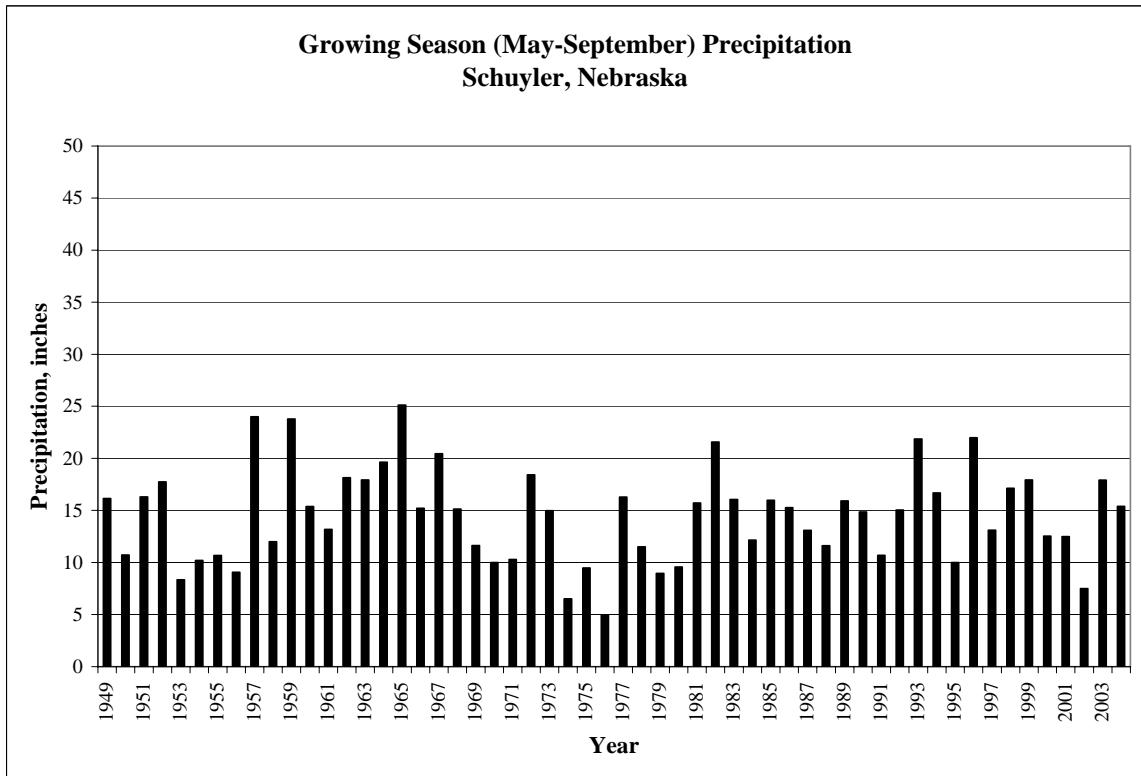


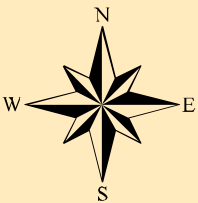
Figure LP-13. Growing Season (May-September) Precipitation at Schuyler.



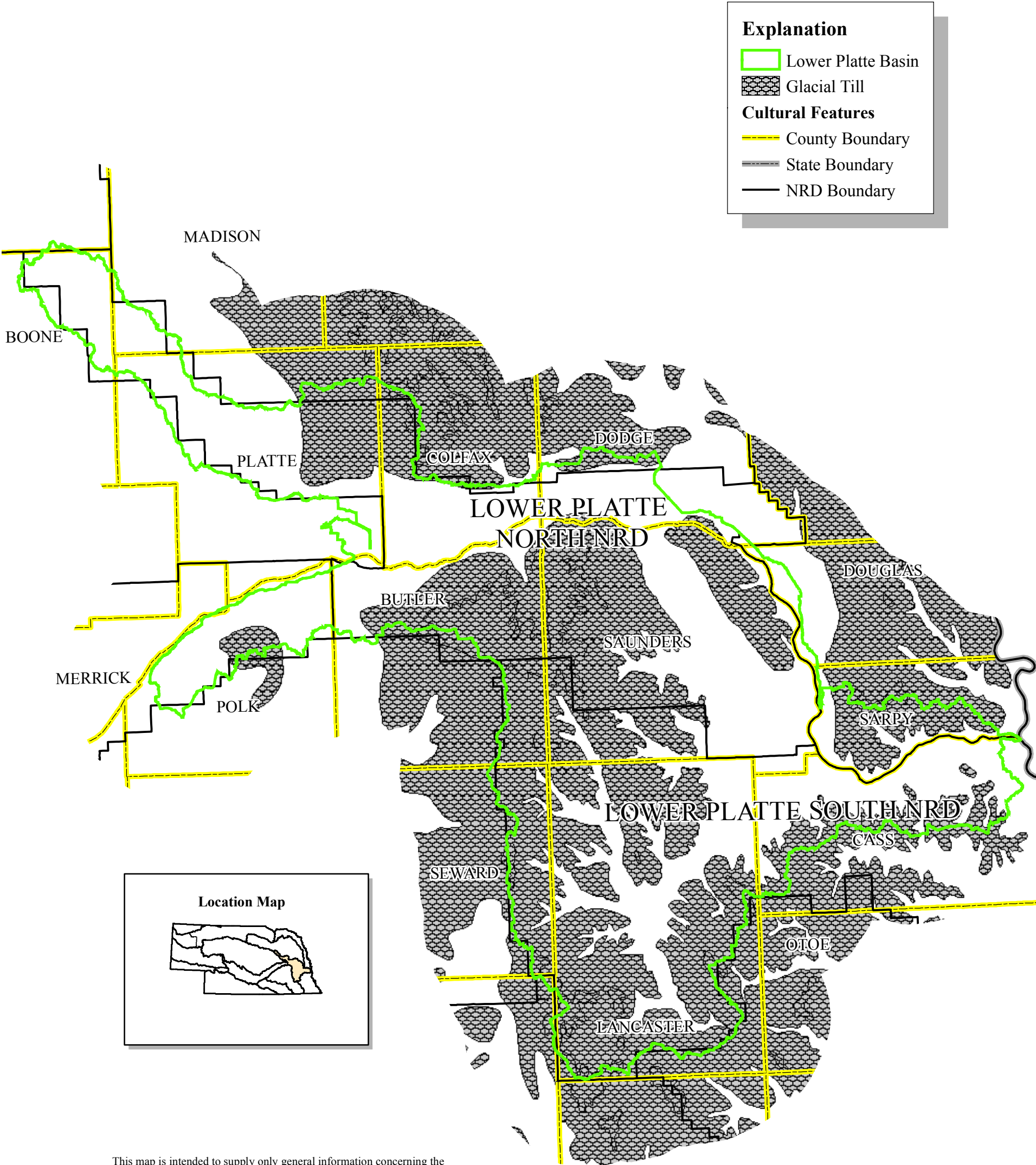


Glacial Till

LOWER PLATTE RIVER BASIN



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Glacial till information provided by the UNL Conservation and Survey Division: <http://csd.unl.edu/general/gis-datasets.asp>.

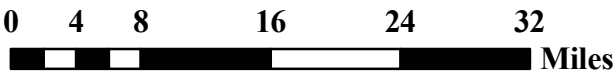


Table LP-1. – Aquifers in unconsolidated surficial deposits (modified from Druliner and Mason, 2001; LPSNRD, 1995)

System	Hydrogeologic unit	Character and description	Maximum thickness, in feet	Hydrogeologic characteristics
Quaternary	Platte River Aquifer	Alluvial sand, gravel and silt deposited within incised bedrock valley of the Platte River.	70	Unconfined and hydrologically connected with the Platte River. Yields 900 to 2000 gal/min of water to wells.
	Missouri River Aquifer	Alluvial sand, gravel and silt deposited within incised bedrock valley of the Missouri River.	80	Unconfined to semi-confined and hydrologically connected with the Missouri River. Wells generally yield 300 to 700 gal/min, and locally yield as much as 1,500 gal/min.
	Paleovalley Alluvial Aquifers	Fluvial silt, sand, gravel and clay deposits within bedrock valleys. Commonly underlying thick fine-grained deposits of glacial till and loess.	275	Semi-confined to confined alluvial aquifers. May yield 400 to 1,200 gal/min of water to wells.
	Loess	Silt with a little very fine sand and clay deposited as wind-blown dust.	unknown	May provide small amounts of water to shallow stock or domestic wells.
	Till	Ice deposited silty, sandy clay with some gravel, pebble, and cobbles.	unknown	Relatively impermeable but may contain small perched ground water or sand deposits that yield water to small capacity wells.

Table LP-2. – Characteristics of bedrock aquifers (modified from Druliner and Mason, 2001; LPSNRD, 1995; Sniegocki, 1955)

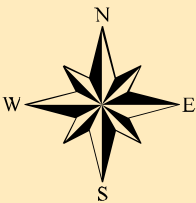
System	Hydrogeologic unit	Character and description	Maximum thickness, in feet	Hydrogeologic characteristics
Tertiary	Ogallala Group	Gravel, sand, silt, clay, with some lime-cemented beds.	0-200	Widespread aquifer in Nebraska, but not an important source of water in the Lower Platte River Basin.
Cretaceous	Dakota Sandstone	Massive to crossbedded friable sandstone interbedded with clayey to slightly sandy shales. Sandstone may contain ironstone or siderite concretions and chert pebbles.	<140	Unconfined or semi-confined aquifer. Wells can yield 50 to 750 gal/min of water to wells. Water is of variable quality. Used as a primary water source only when other sources are not available
Permian and Pennsylvanian Undifferentiated	Undifferentiated shale, limestone and sandstone	Shales interbedded with limestone and sandstone. Shales may be laminated clayey, sandy, calcareous, fossiliferous and may contain gypsum. Limestone may be massive, geodal, fossiliferous or contain chert. Sandstone is generally thin bedded and may contain coal.	<1000	Not a major aquifer. Fractured limestone may yield 20 to 50 gal/min of water to wells. Yield may be increased by locally thick sandstone or if hydrologically connected to overlying unconsolidated sand and gravel deposits.



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Bedrock Geology

LOWER PLATTE RIVER BASIN



Explanation

Lower Platte Basin

Bedrock Geology

Ogallala

Fox Hills

Pierre

Niobrara

Carlile

Greenhorn-Graneros

Dakota

Chase

Council Grove

Admire

Wabaunsee

Shawnee

Douglas

Lansing

Kansas City

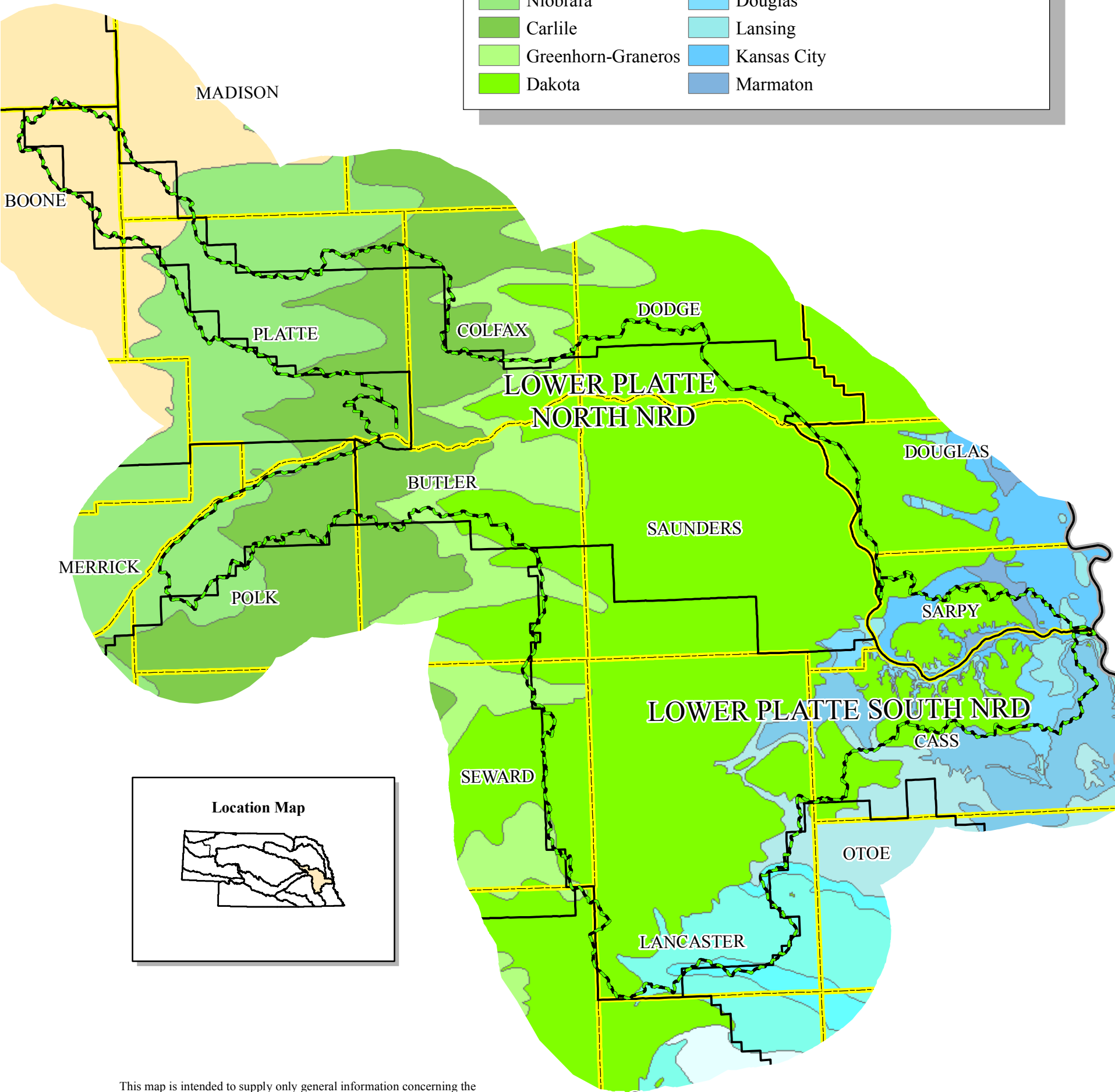
Marmaton

Cultural Features

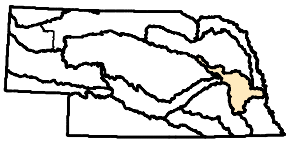
County Boundary

State Boundary

NRD Boundary



Location Map



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Bedrock geology information provided by the UNL Conservation and Survey Division: <http://csd.unl.edu/general/gis-datasets.asp>.

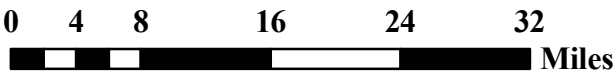
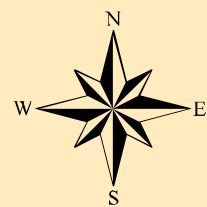


Figure LP-15.

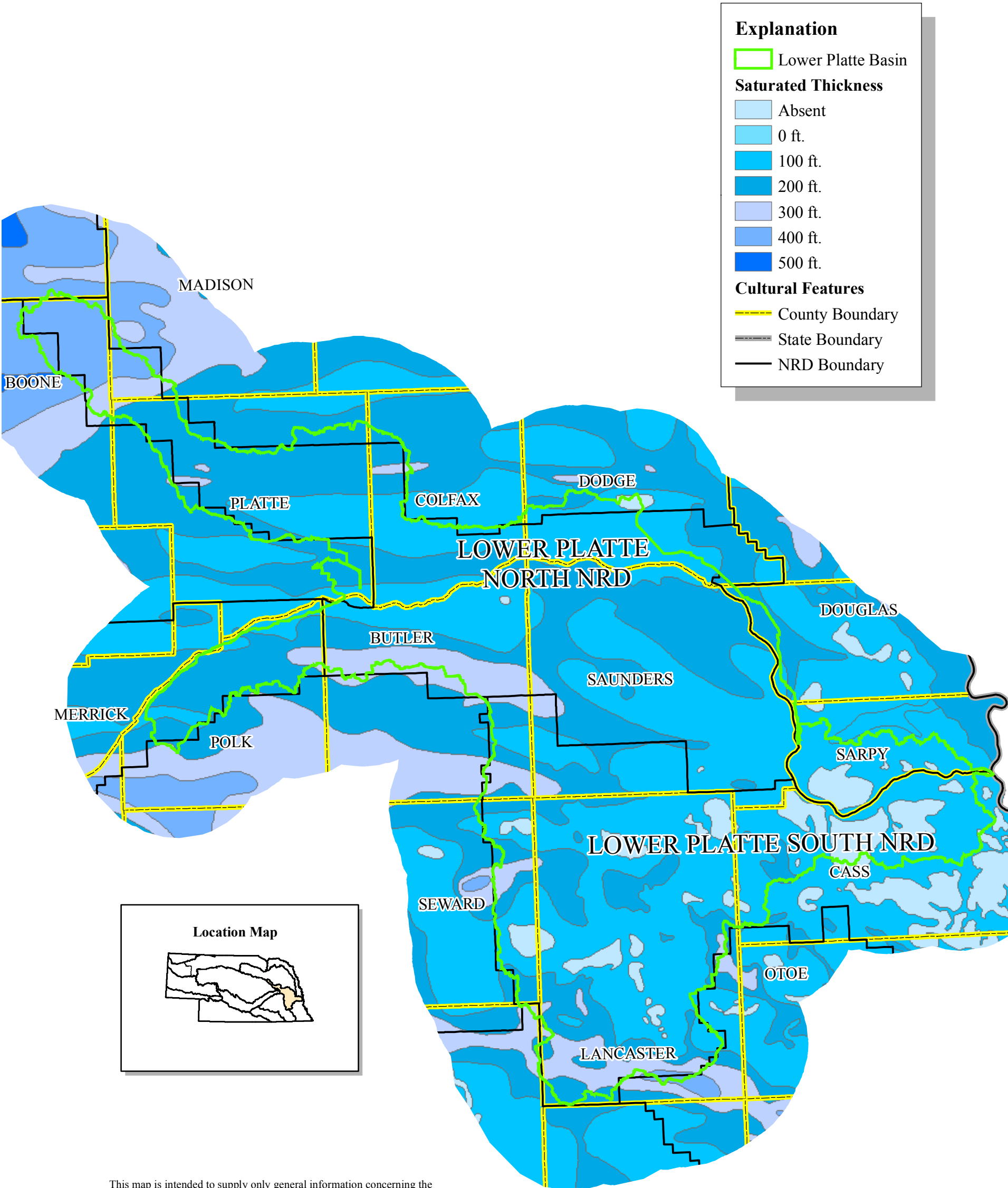
Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Bedrock geology map produced by Kevin J. Schwartzman, October 1, 2005



SATURATED THICKNESS LOWER PLATTE RIVER BASIN



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Saturated thickness information provided by the UNL Conservation and Survey Division: <http://csd.unl.edu/general/gis-datasets.asp>.

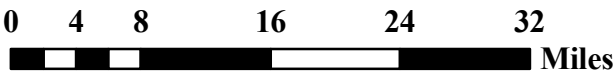


Figure LP-16.

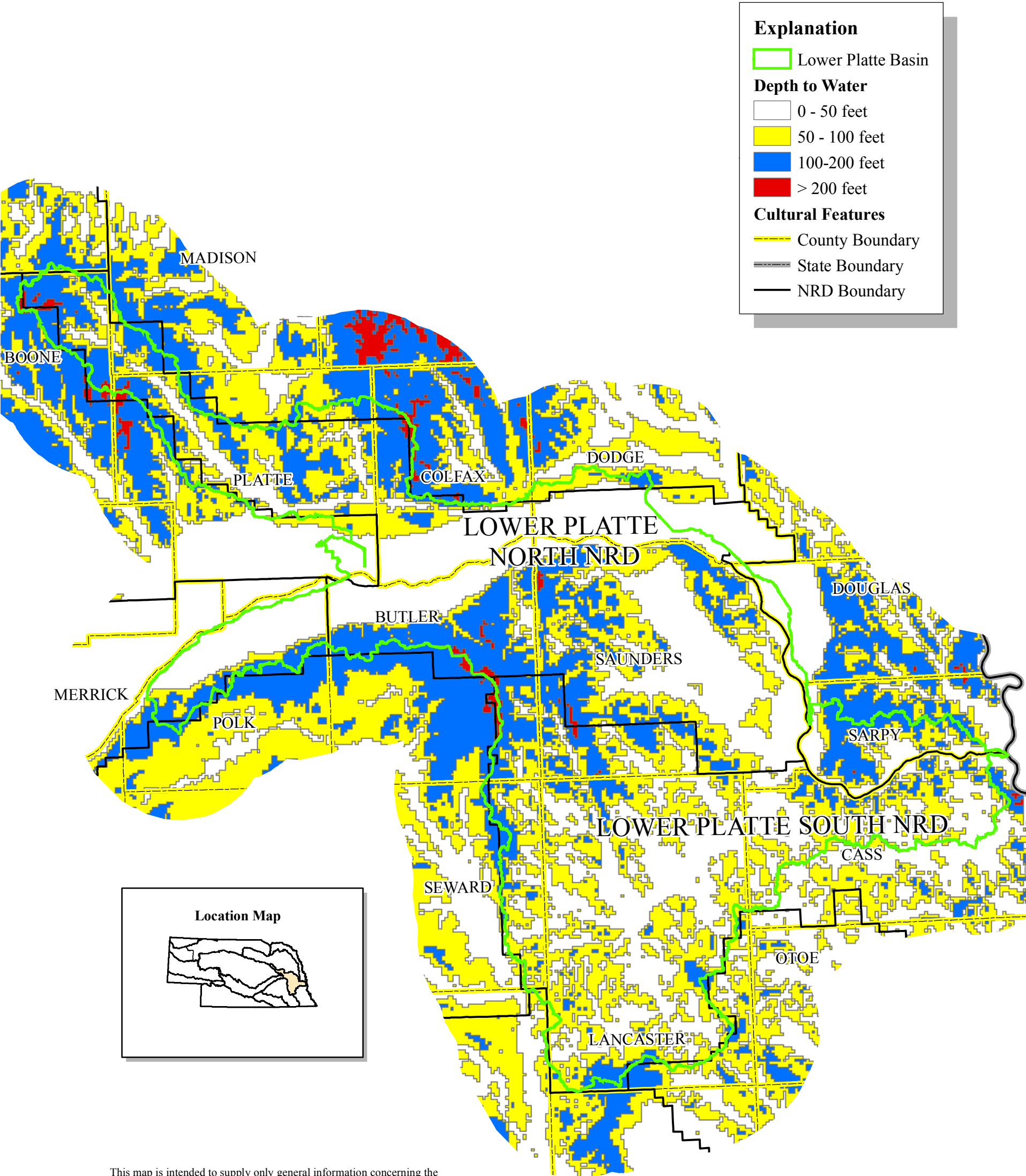
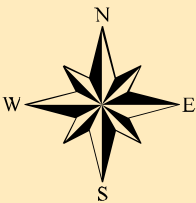
Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Saturated thickness map produced by Kevin J. Schwartzman, October 12, 2005



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Depth to Water

LOWER PLATTE RIVER BASIN



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Depth to water information provided by the UNL Conservation and Survey Division: <http://csd.unl.edu/general/gis-datasets.asp>.

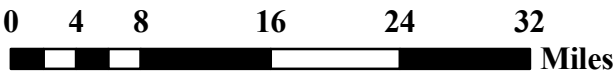


Figure LP-17.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Bedrock geology map produced by Kevin J. Schwartman, October 12, 2005



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Transmissivity

LOWER PLATTE RIVER BASIN

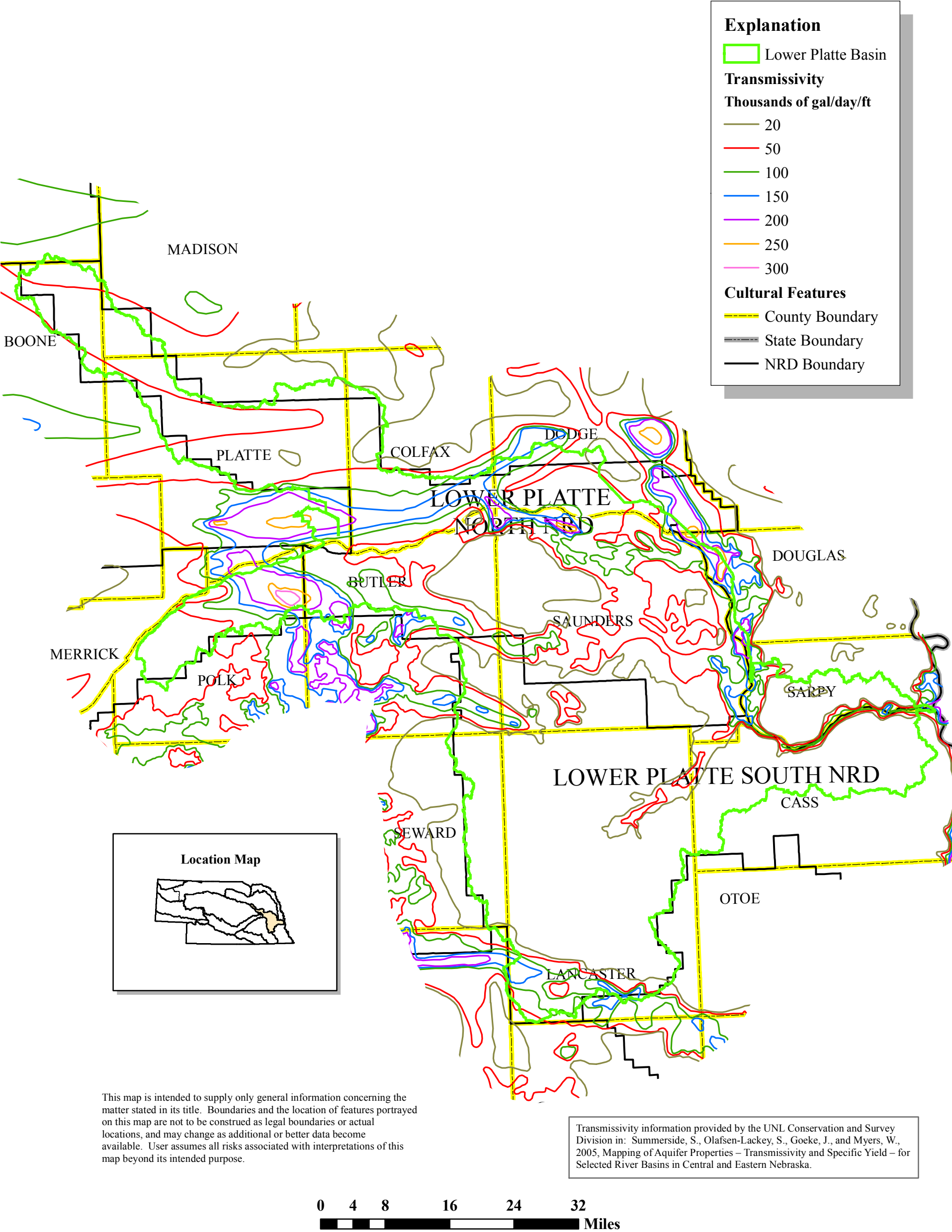
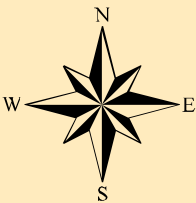


Figure LP-18.

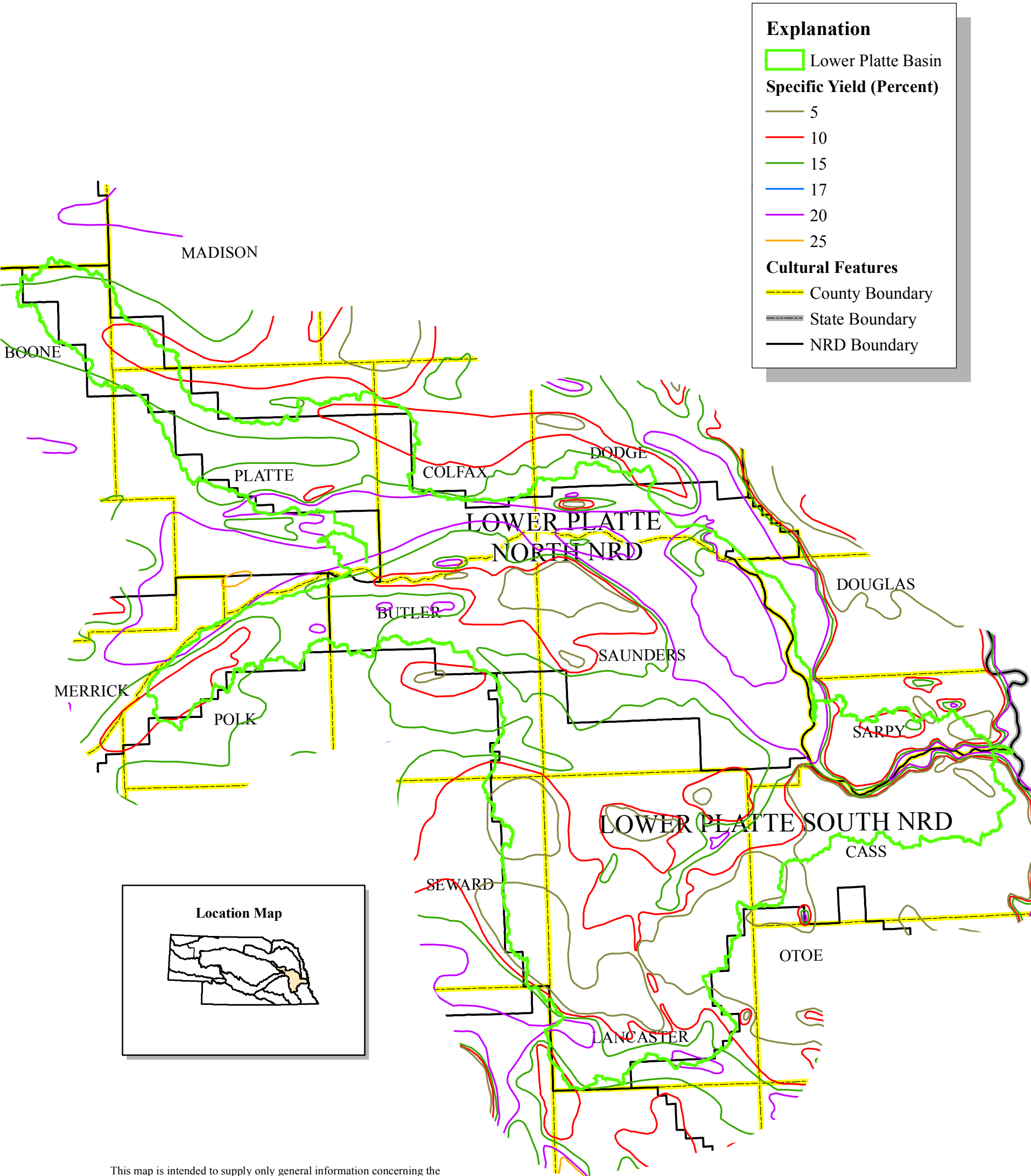
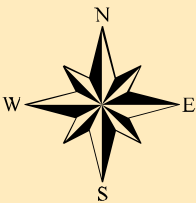
Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Transmissivity map produced by Kevin J. Schwartzman, October 12, 2005



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Specific Yield

LOWER PLATTE RIVER BASIN



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Specific yield information provided by the UNL Conservation and Survey Division in: Summerside, S., Olafsen-Lackey, S., Goeke, J., and Myers, W., 2005, Mapping of Aquifer Properties – Transmissivity and Specific Yield – for Selected River Basins in Central and Eastern Nebraska.

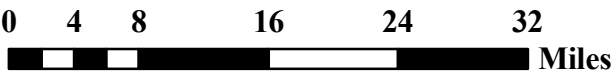


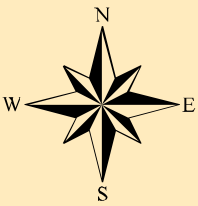
Figure LP-19.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Specific yield map produced by Kevin J. Schwartman, October 12, 2005

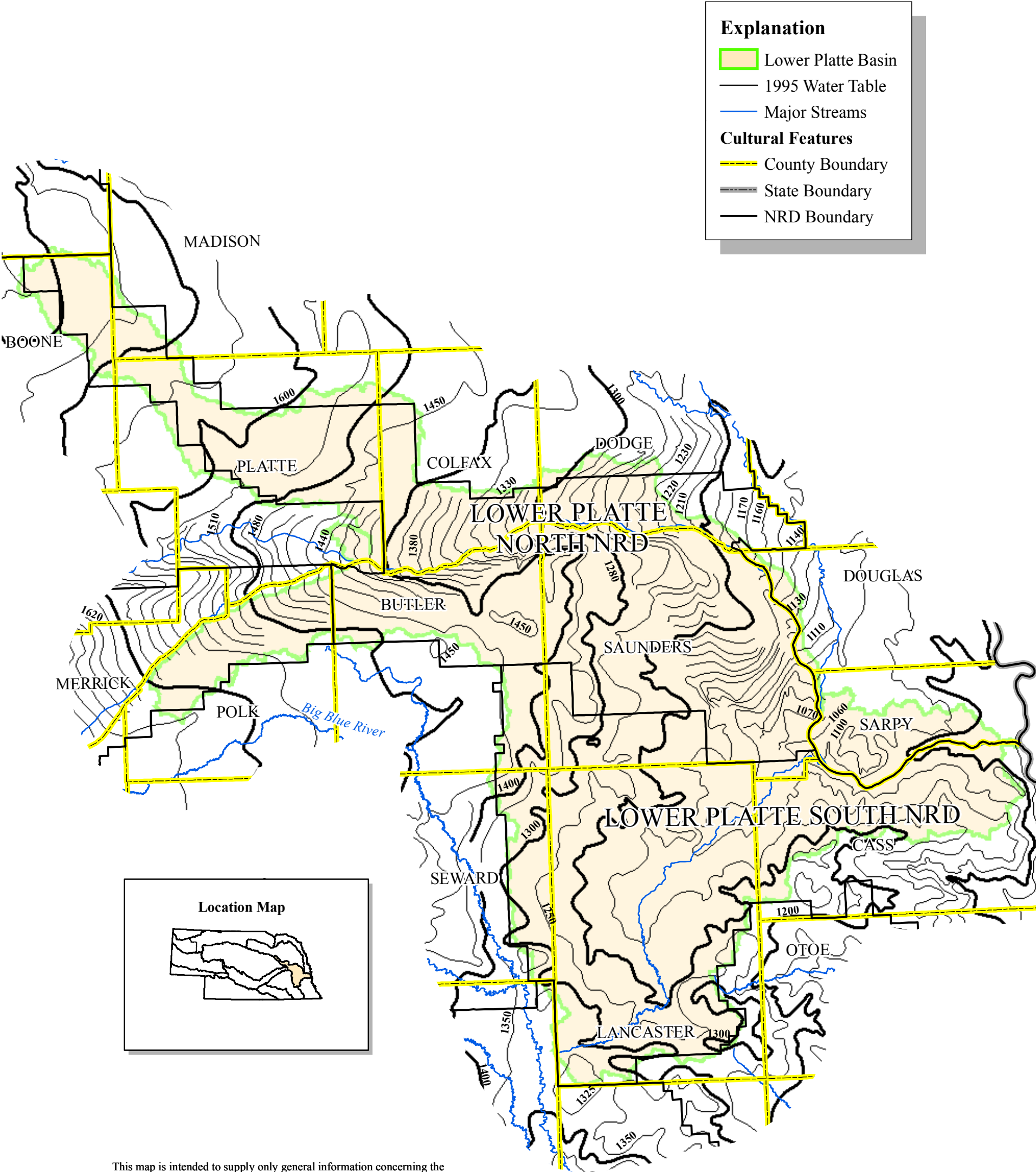


1995 Ground Water Table

LOWER PLATTE RIVER BASIN

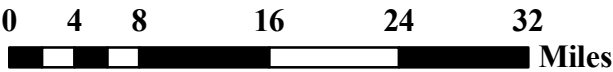


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Water table information provided by the UNL Conservation and Survey Division: <http://csd.unl.edu/general/gis-datasets.asp>.

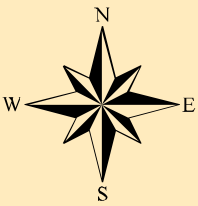


Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
map produced by Kevin J. Schwartzman, October 12, 2005

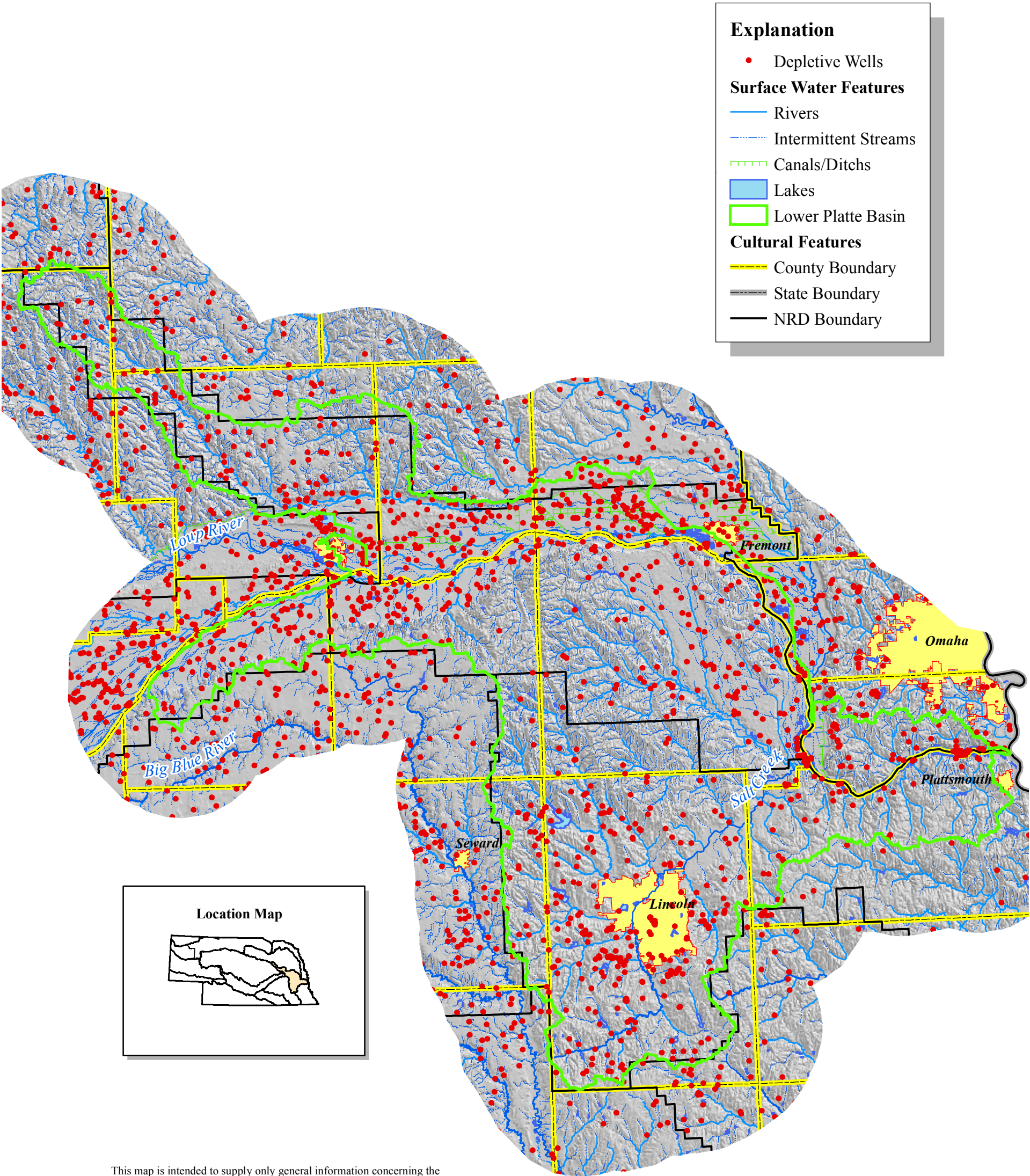
Figure LP-20.



Depletive Ground Water Wells LOWER PLATTE RIVER BASIN



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Depletive well information is from the DNR Registered Ground Water Well Database, as of January 2005 and include wells used for aquaculture, commercial, domestic, irrigation, public water supply, dewatering, stock and others except wells for non-consumptive uses.

0 4 8 16 24 32
Miles

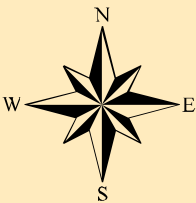
Figure LP-21.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Depletive ground water wells map produced by Shuhai Zheng, October 12, 2005.

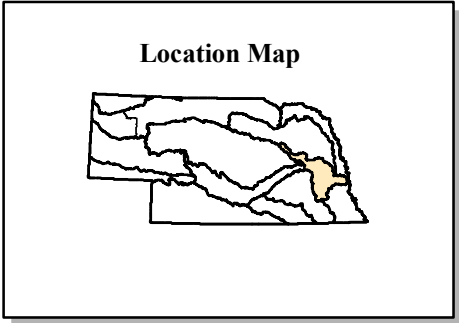
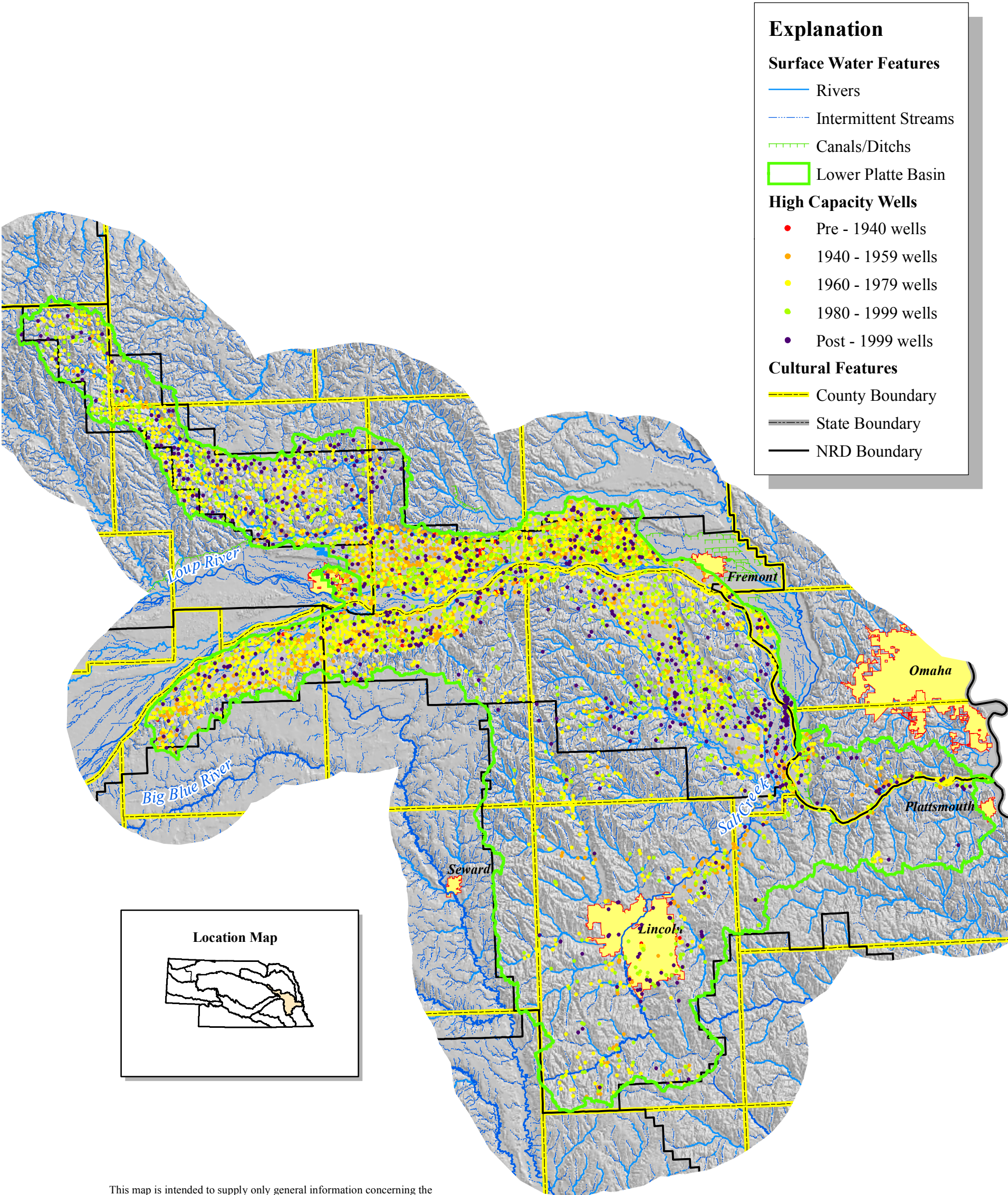


High Capacity Wells by Completion Years

LOWER PLATTE RIVER BASIN



Planning and Assistance Division



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High Capacity well information is from the DNR Registered Ground Water Well Database, as of January 2005 and includes depletive wells with registered pumping rates equal to or greater than 50 gpm.

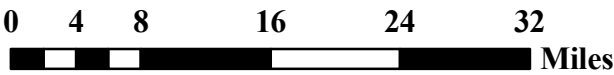
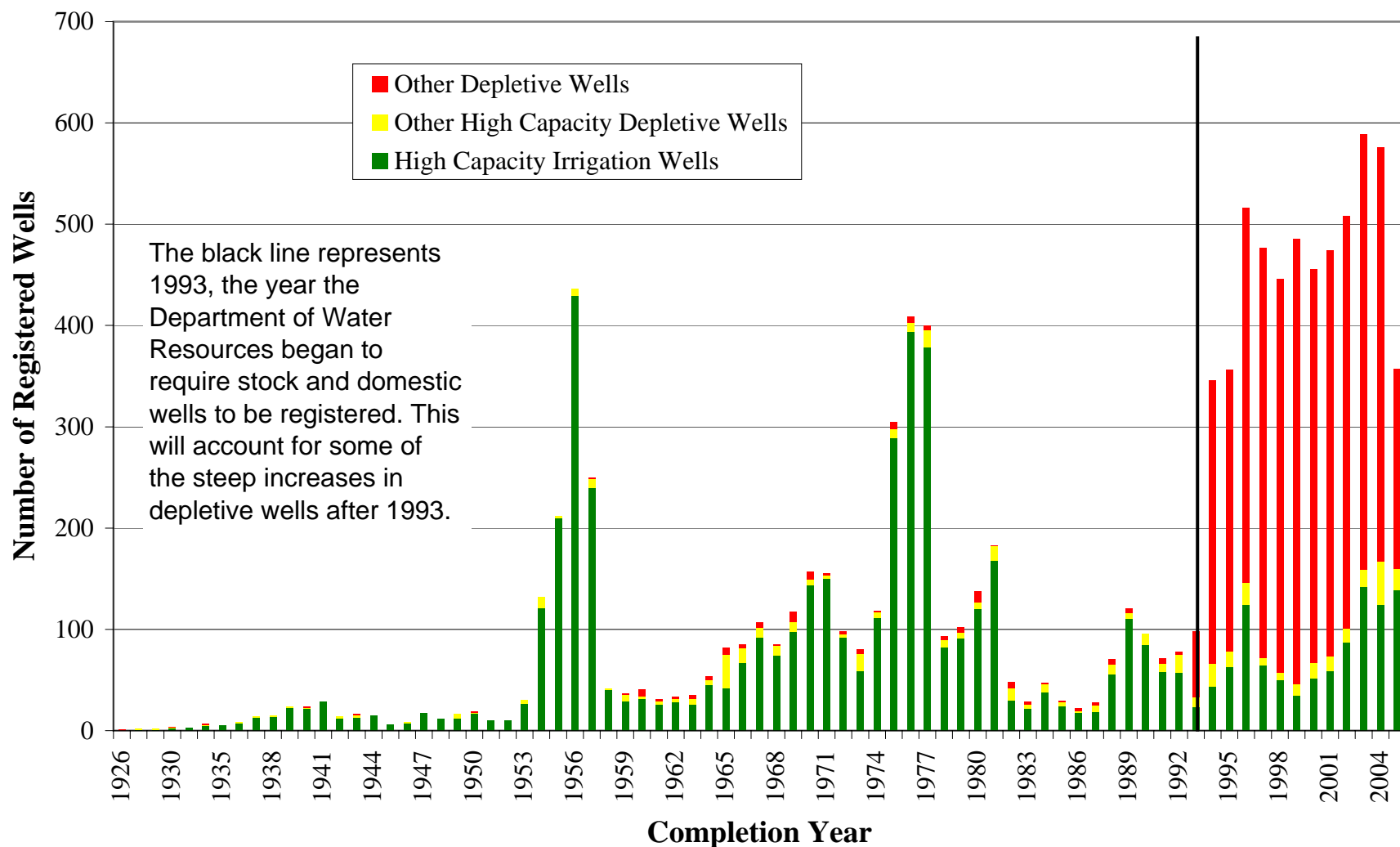


Figure LP-22.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
High capacity wells map produced by Shuhai Zheng, November 10, 2005.

Registered Number of Depletive Wells by Completion Date Lower Platte River Basin

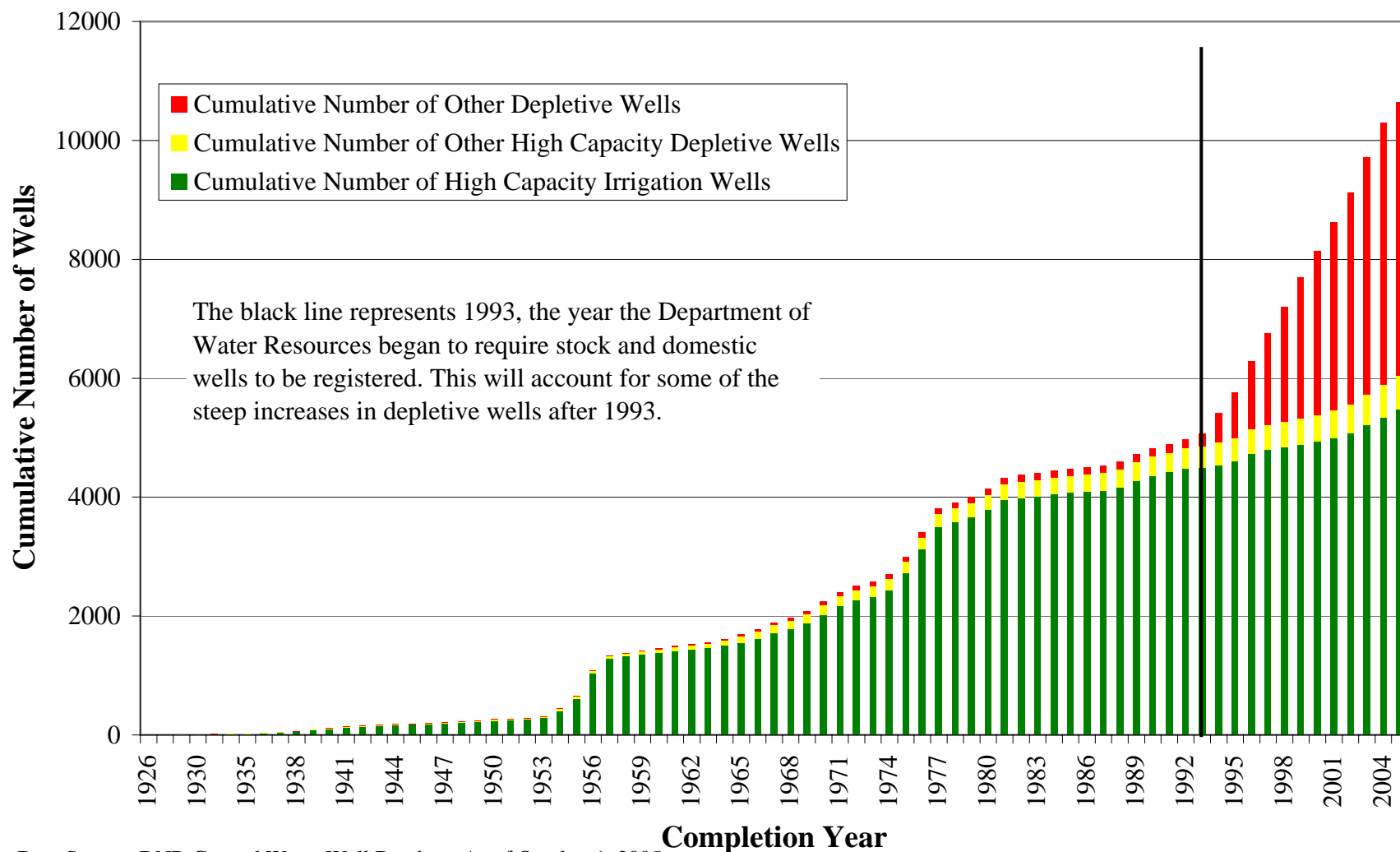


Data Source: DNR Ground Water Well Database As of October 1, 2005

Figure LP-23

By Shuhai Zheng, 12/9/2005

Cumulative Number of Depletive Wells by Completion Date Loup River Basin



Data Source: DNR Ground Water Well Database As of October 1, 2005

Figure LP-24

By Shuhai Zheng, 12/9/2005

Table LP-3. Average Irrigated Acreage 1950-2003 for Counties Fully or Partially in the Lower Platte River Basin

County Name	Estimated Average Irrigated Acreage by County						
	<i>Percent of County in Lower Platte Basin</i>	<i>1950-1959</i>	<i>1960-1969</i>	<i>1970-1979</i>	<i>1980-1989</i>	<i>1990-1999</i>	<i>2000-2003</i>
Antelope	<1	3140	14709	89076	160910	184990	213225
Boone	13	10299	25671	63326	111210	141590	164400
Butler	51	8458	29408	65290	94590	106100	112225
Cass	47	499	768	2265	4070	2720	1950
Colfax	43	6048	16812	31426	59530	59970	63850
Dodge	22	6865	19554	51683	80740	93890	104050
Douglas	6	825	2188	7555	12830	12640	9850
Lancaster	86	980	4445	9841	13600	12650	12925
Madison	6	2219	8494	37086	70420	86440	102150
Merrick	<1	47192	78962	119629	145480	162730	173650
Platte	46	10651	31718	77881	127710	161700	188775
Polk	33	19512	58246	99470	113480	138180	151225
Saline	1	6762	27831	56187	70740	80140	89875
Sarpy	51	816	981	3597	5390	6690	6375
Saunders	100	1969	6444	30276	60380	80570	99075
Seward	19	9461	35109	75057	97440	114280	123375
Total		135695	361340	819645	1228520	1445280	1616975
% Change from Previous 10 Years			166.29%	126.83%	49.88%	17.64%	11.88%

* The percentage is the percentage of the county area which is in the Lower Platte Basin. It does not necessarily represent the percentage of irrigated county acreage in the Lower Platte River Basin.

Data Source: <http://www.usda.gov/nass/>, National Agricultural Statistics Service, U.S. Department of Agriculture

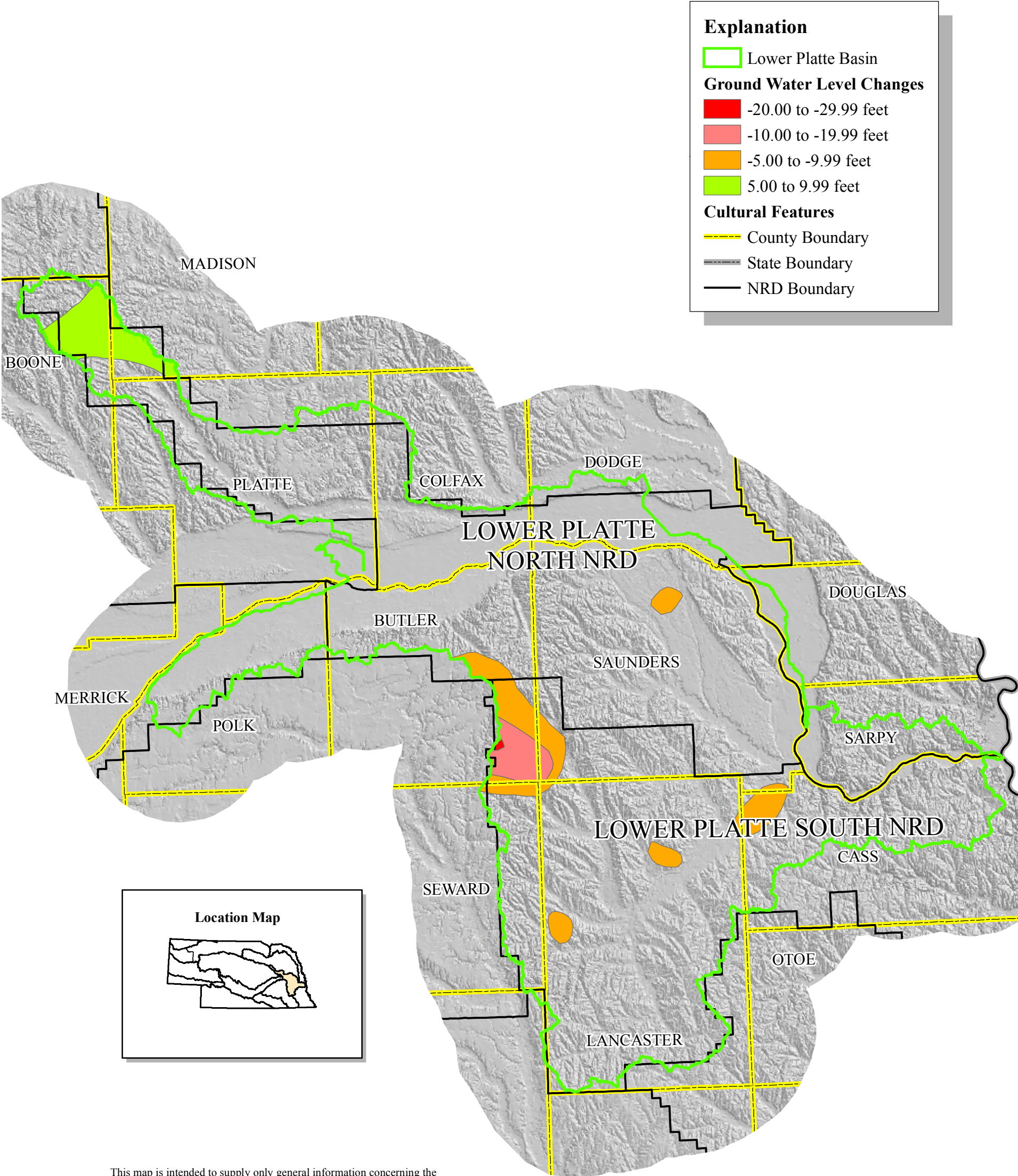


Ground Water-level Changes Pre-development to 2005

LOWER PLATTE RIVER BASIN



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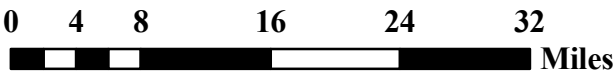


Figure LP-25.

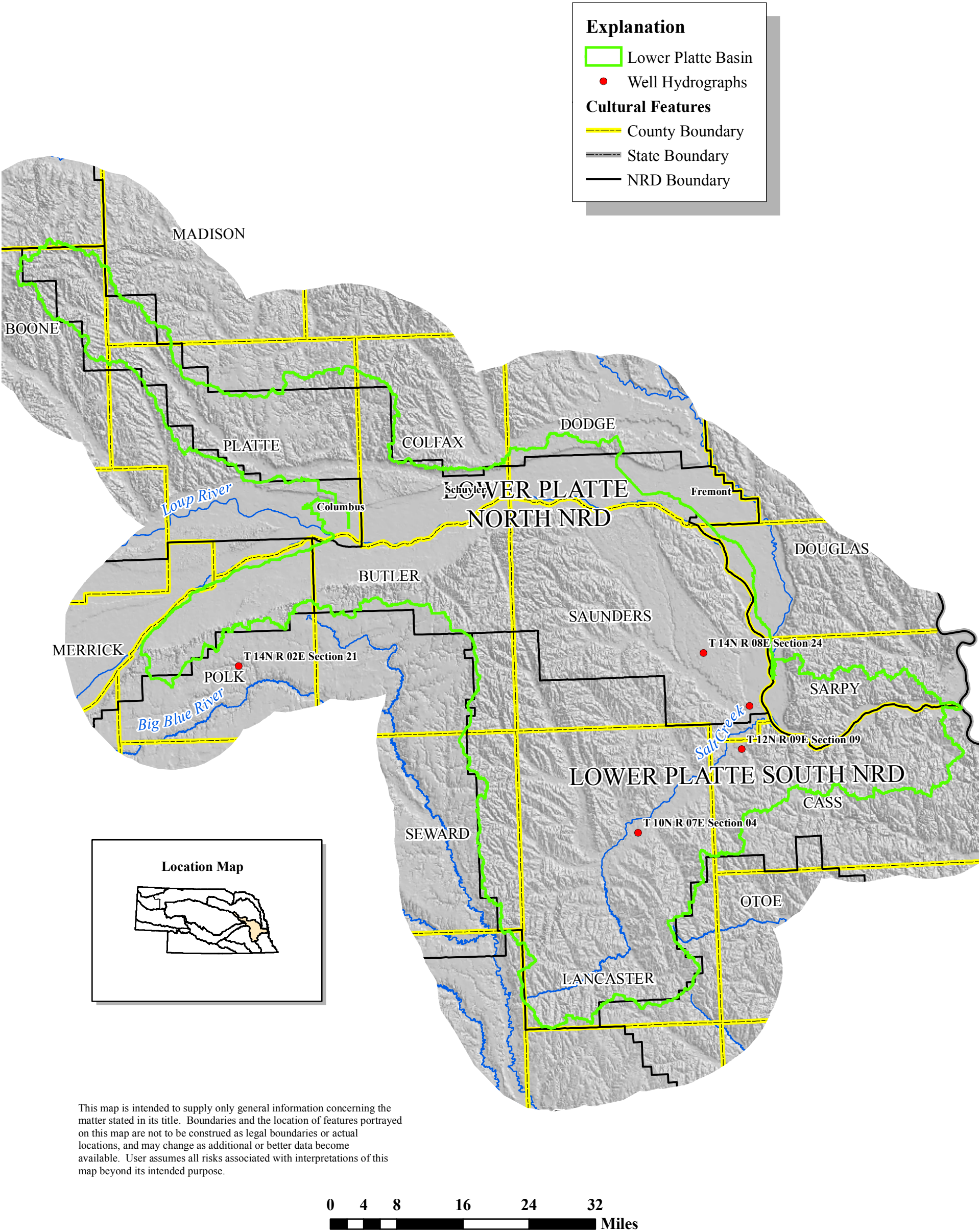
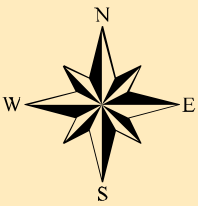
Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Ground water Level Changes added by Shuhai Zheng, October 12, 2005



Planning and Assistance Division

Hydrograph Locations

LOWER PLATTE RIVER BASIN



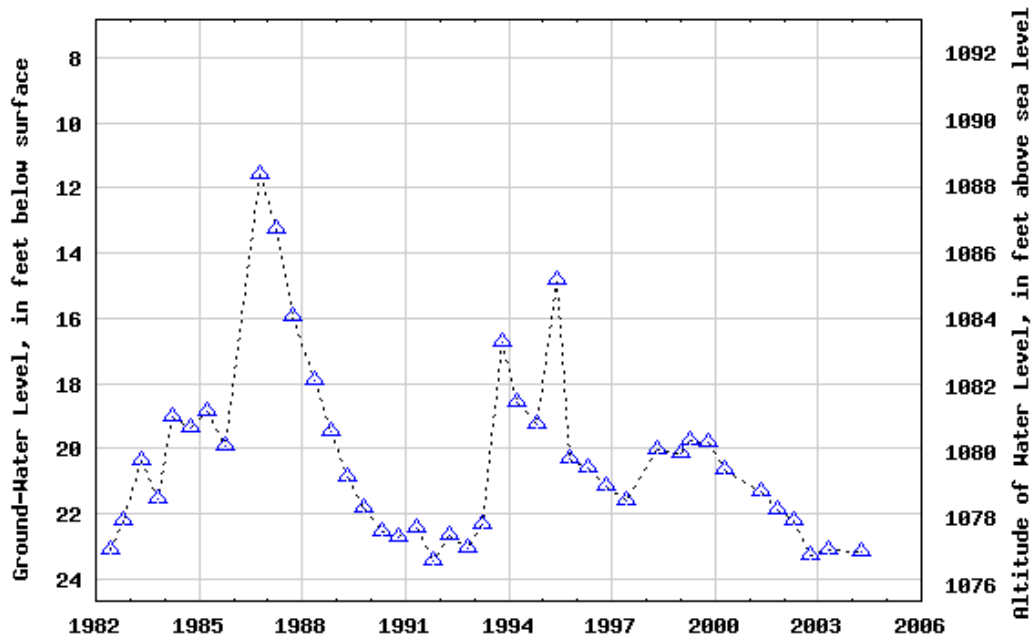
This map is intended to supply only general information concerning the matter stated in its title. Boundaries and the location of features portrayed on this map are not to be construed as legal boundaries or actual locations, and may change as additional or better data become available. User assumes all risks associated with interpretations of this map beyond its intended purpose.

Figure LP-26.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Precipitation gages map produced by Kevin Schwartman, November 2, 2005.



USGS 410002096232301 12N 9E22AA 1



Provisional Data Subject to Revision

Cass County, Nebraska

Hydrologic Unit Code 10200203

Latitude 41°00'02", Longitude 96°23'23" NAD27

Land-surface elevation 1,100.00 feet above sea level NGVD29

The depth of the well is 93.0 feet below land surface. This well is

completed in the QUATERNARY SAND AND GRAVEL

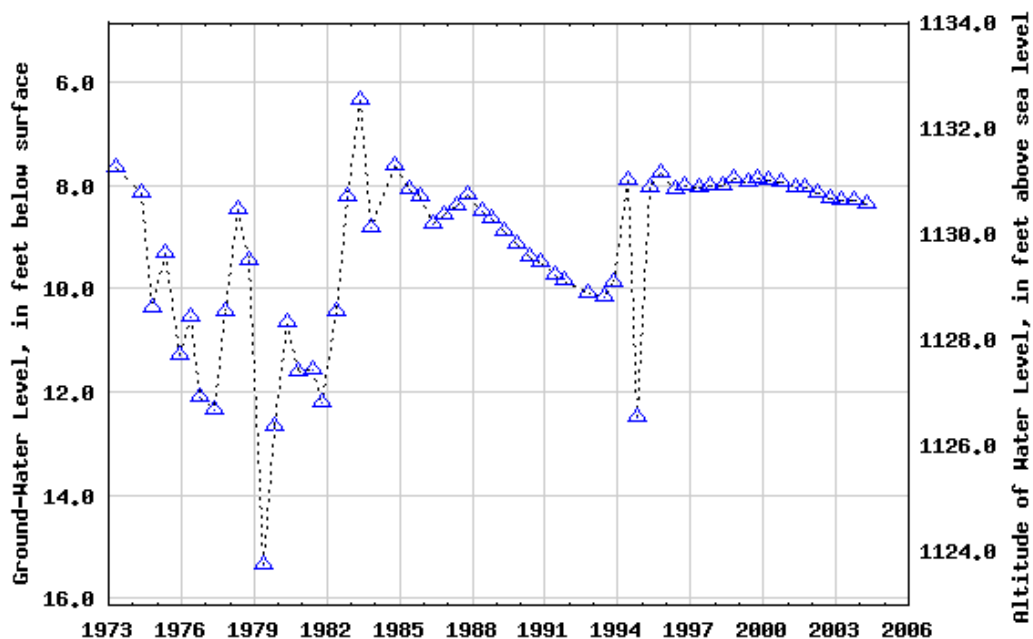
DEPOSITS (112SDGV) local aquifer just above the CRETACEOUS

DAKOTA GROUP regional aquifer.

Figure LB-27



USGS 405205096383201 10N 7E 4BBCD1



Provisional Data Subject to Revision

Lancaster County, Nebraska

Hydrologic Unit Code 10200203

Latitude 40°52'05", Longitude 96°38'32" NAD27

Land-surface elevation 1,138.98 feet above sea level NGVD29

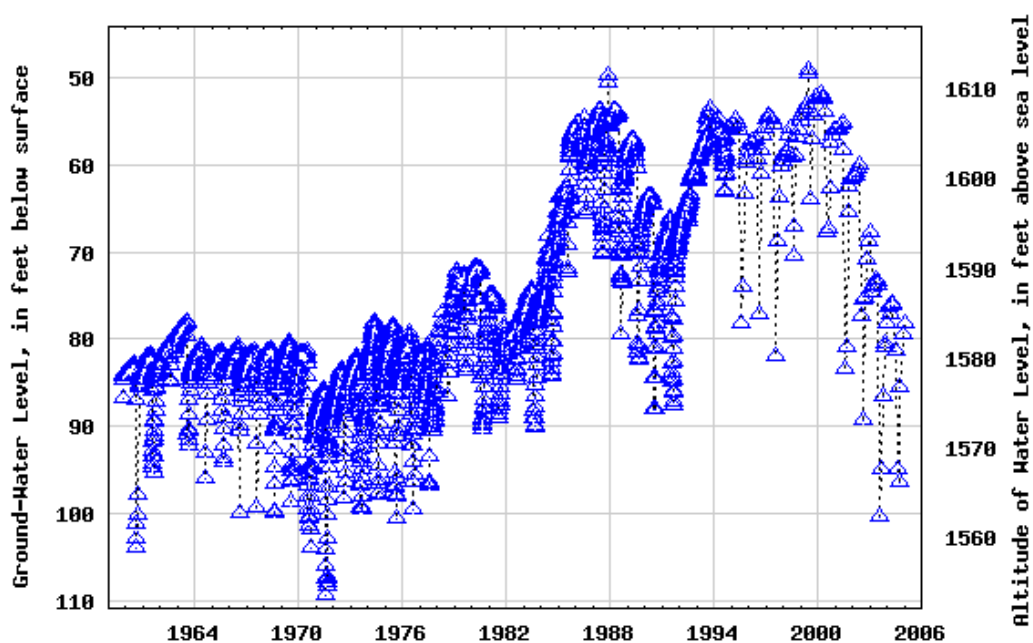
The depth of the well is 33.0 feet below land surface.

This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS, UNDIFFERENTIATED (110SDGV) local aquifer.

Figure LB-28



USGS 411012097325201 14N 2W21DB 1



Provisional Data Subject to Revision

Polk County, Nebraska

Hydrologic Unit Code 10270201

Latitude 41°10'12", Longitude 97°32'52" NAD27

Land-surface elevation 1,662.00 feet above sea level NGVD29

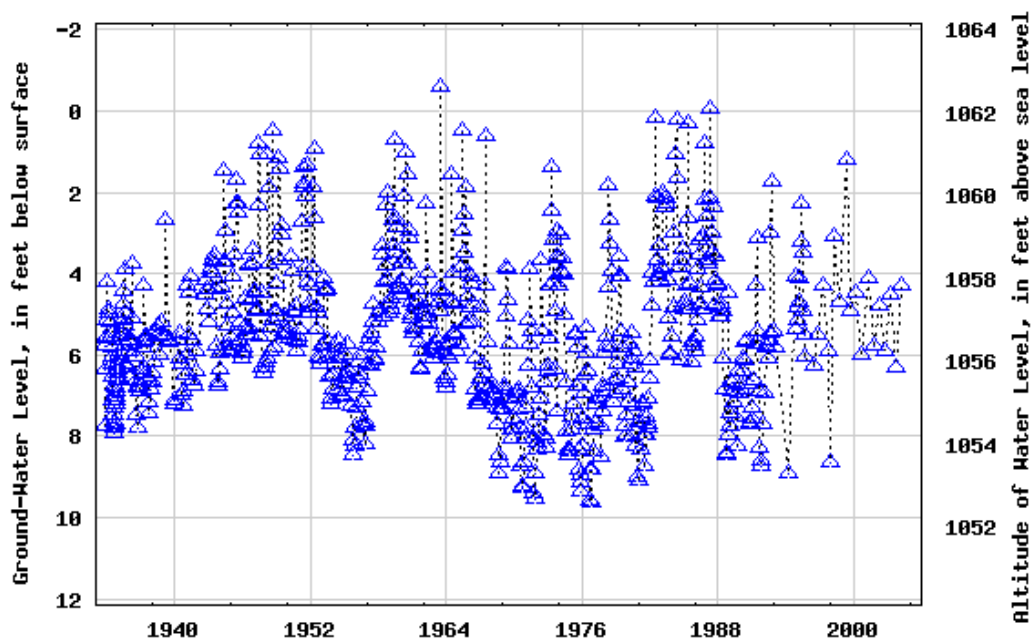
The depth of the well is 180 feet below land surface.

This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure LB-29



USGS 410426096220401 13N 9E24CCCC1



Provisional Data Subject to Revision

Saunders County, Nebraska

Hydrologic Unit Code 10200203

Latitude 41°04'28", Longitude 96°22'04" NAD27

Land-surface elevation 1,062.13 feet above sea level NGVD29

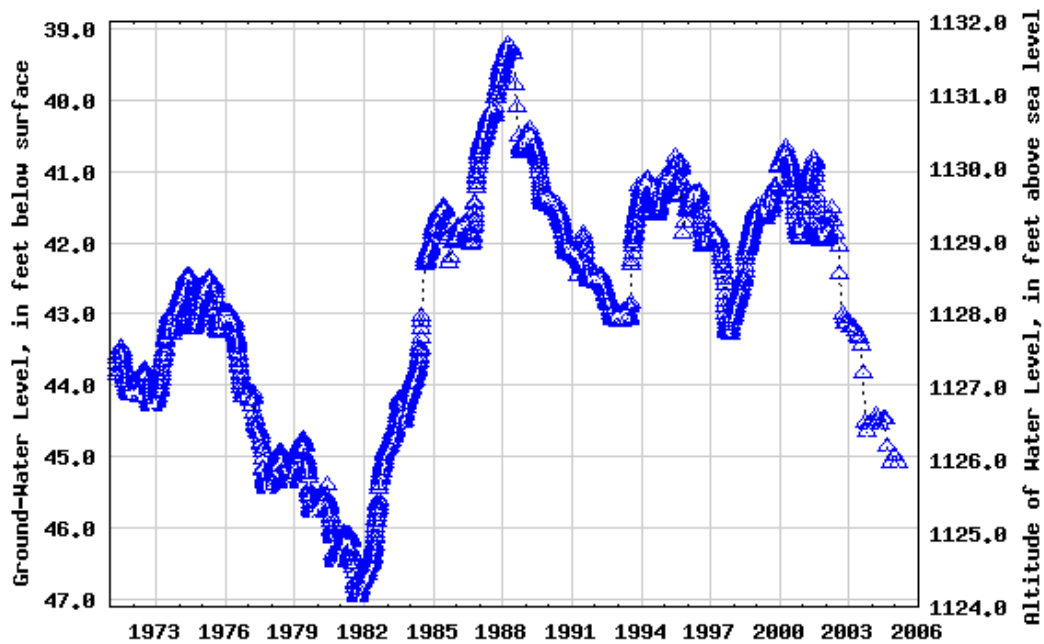
The depth of the well is 12.00 feet below land surface.

This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure LB-30



USGS 411005096281502 14N 8E24ACD 2



Provisional Data Subject to Revision

Saunders County, Nebraska

Hydrologic Unit Code 10200203

Latitude 41°10'05", Longitude 96°28'15" NAD27

Land-surface elevation 1,171. feet above sea level NGVD29

The depth of the well is 80.0 feet below land surface.

This well is completed in the QUATERNARY SAND AND GRAVEL DEPOSITS (112SDGV) local aquifer.

Figure LB-31



Planning and Assistance Division

Stream Gages LOWER PLATTE RIVER BASIN

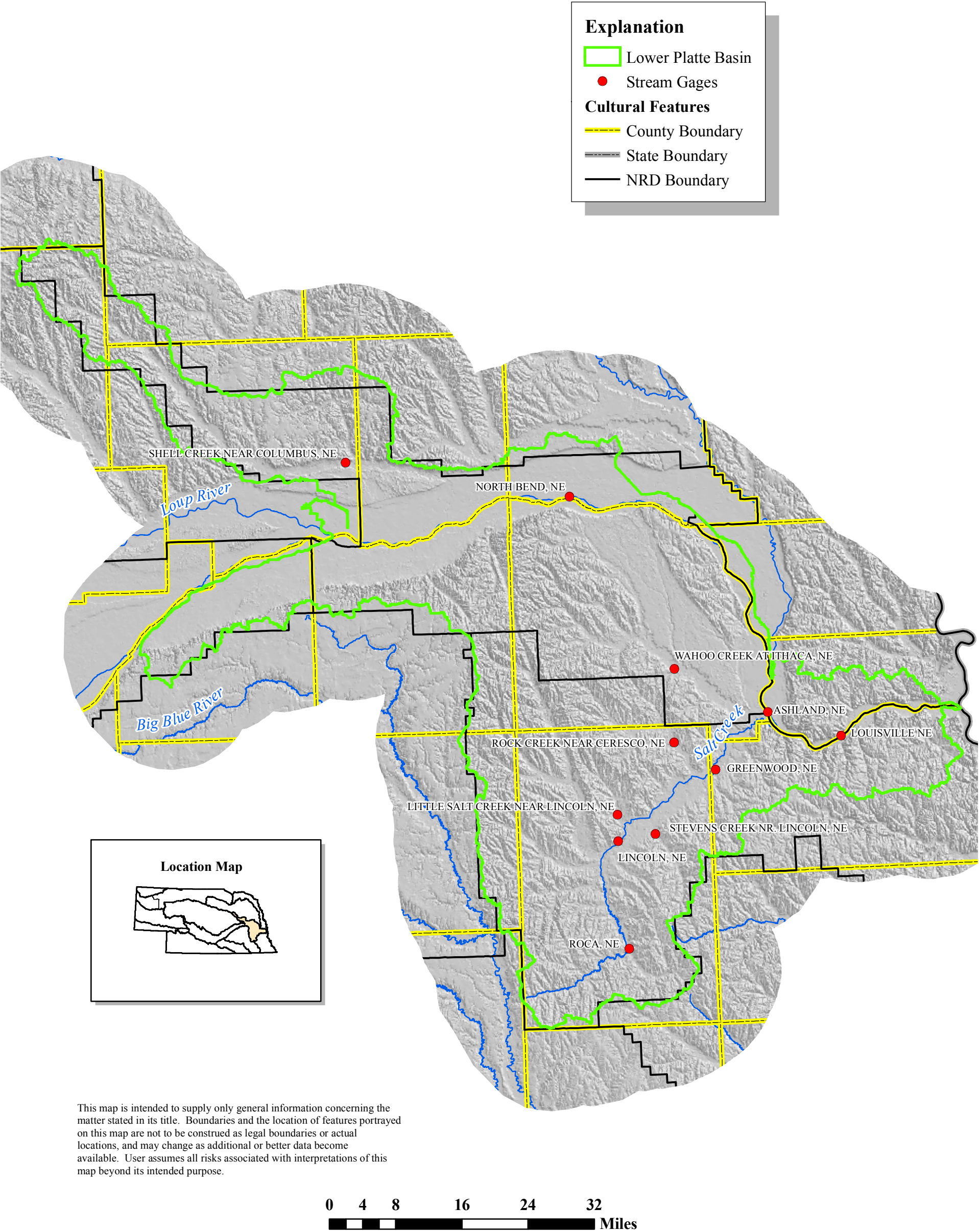
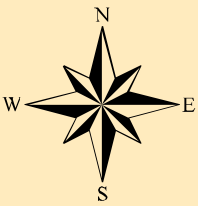


Figure LP-32.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Stream gages map produced by Jeff Shafer, October 19, 2005.

Figure LP-33. Annual Flows, Shell Creek near Columbus.

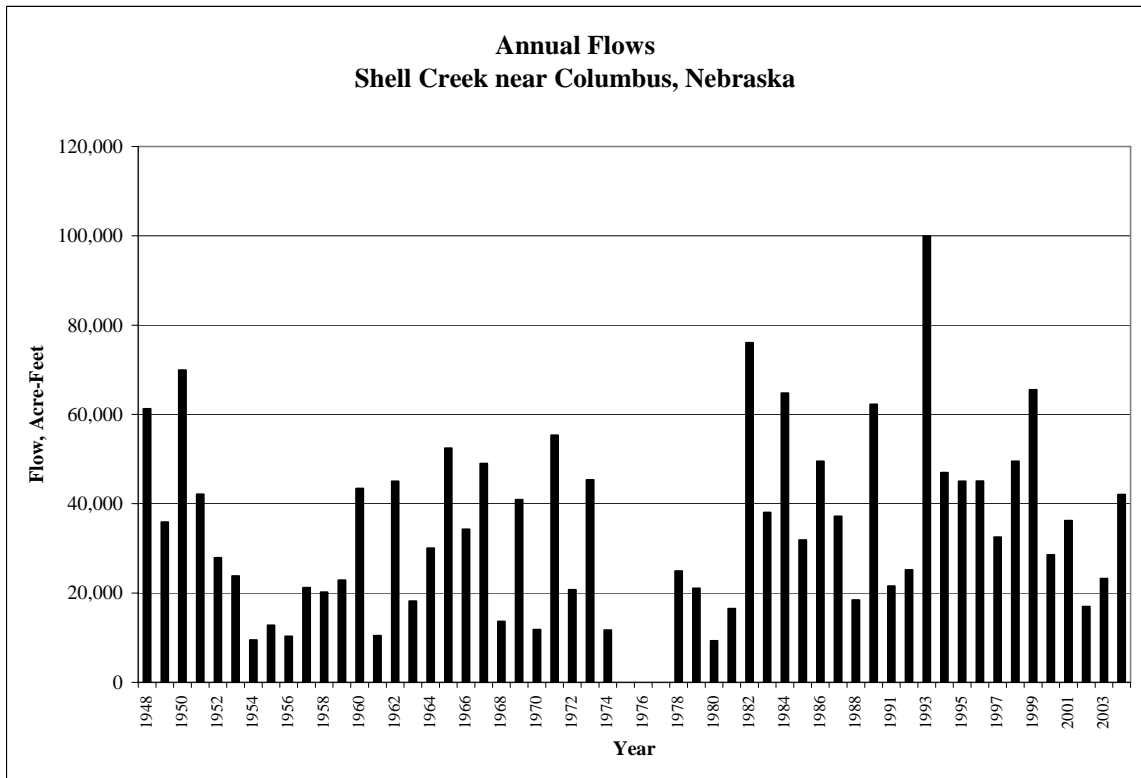


Figure LP-34. Annual Flows, Salt Creek at Roca.

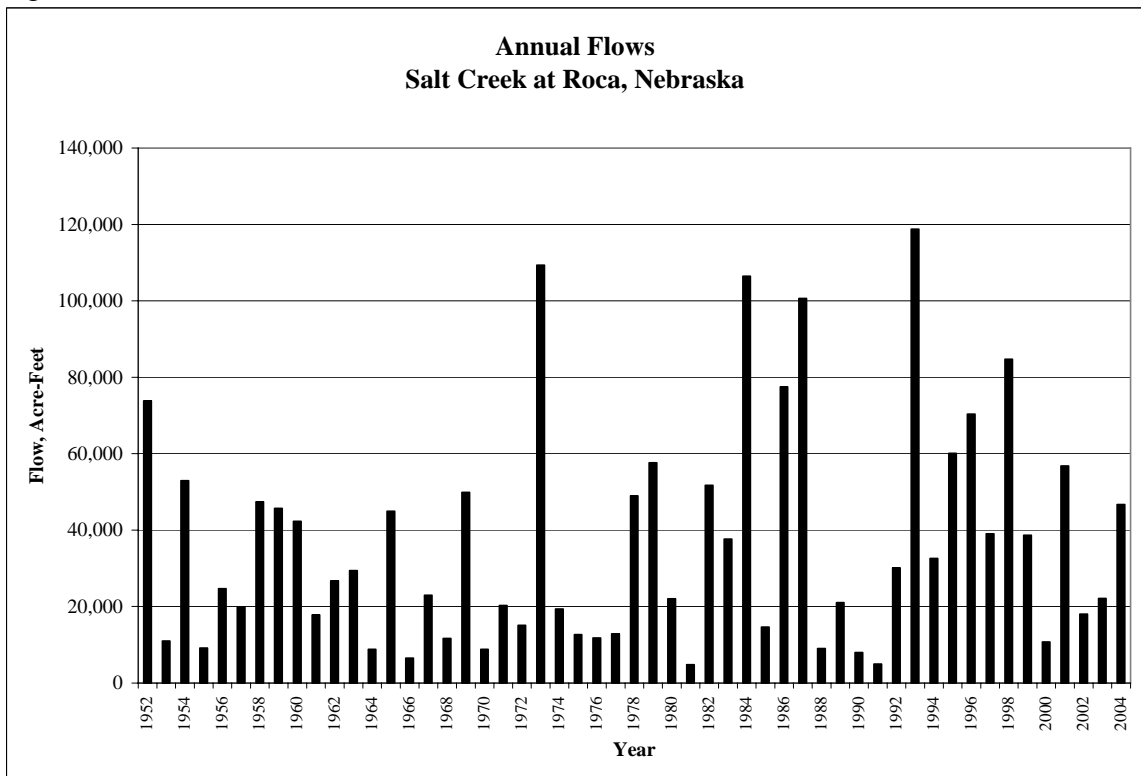


Figure LP-35. Annual Flows, Salt Creek at Lincoln.

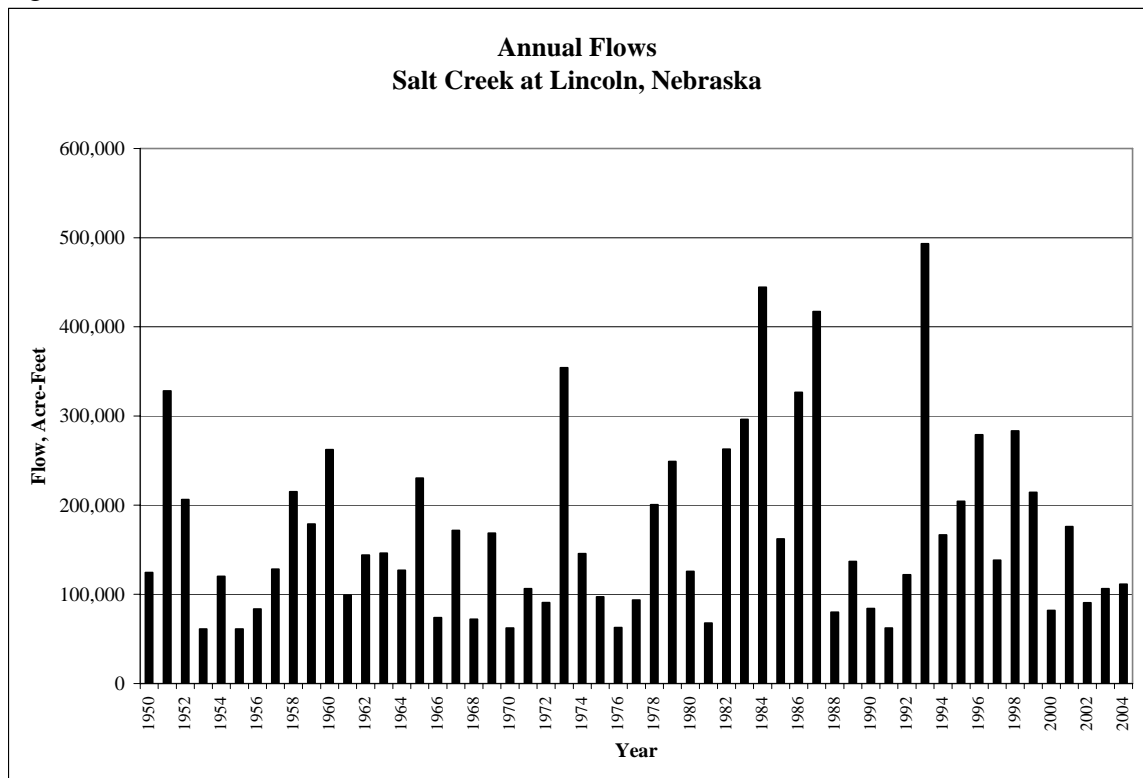


Figure LP-36. Annual Flows, Salt Creek at Greenwood.

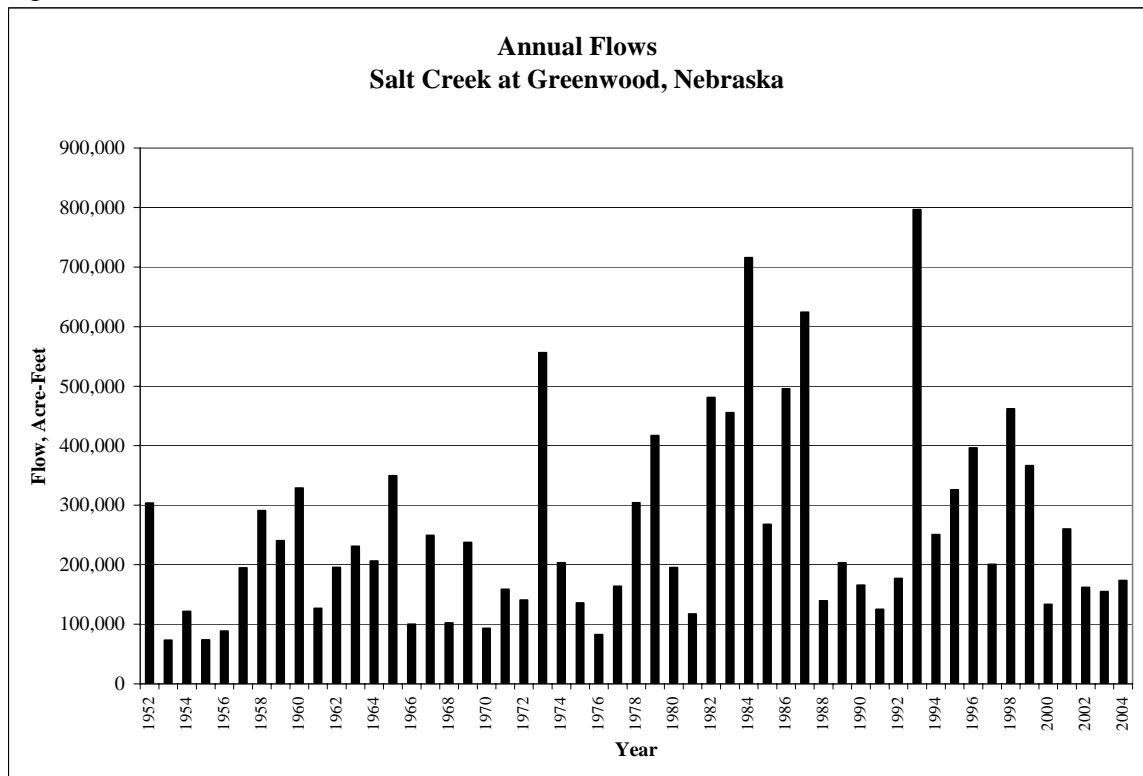


Figure LP-37. Annual Flows, Little Salt Creek near Lincoln.

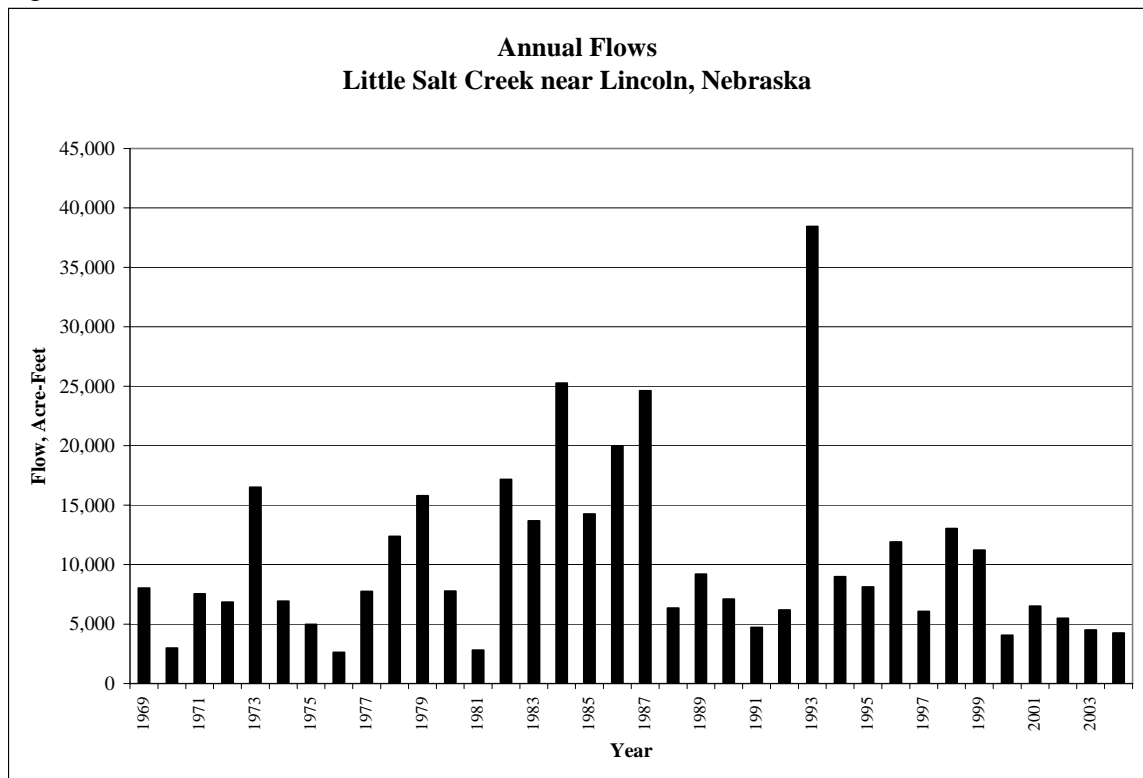


Figure LP-38. Annual Flows, Stevens Creek near Lincoln.

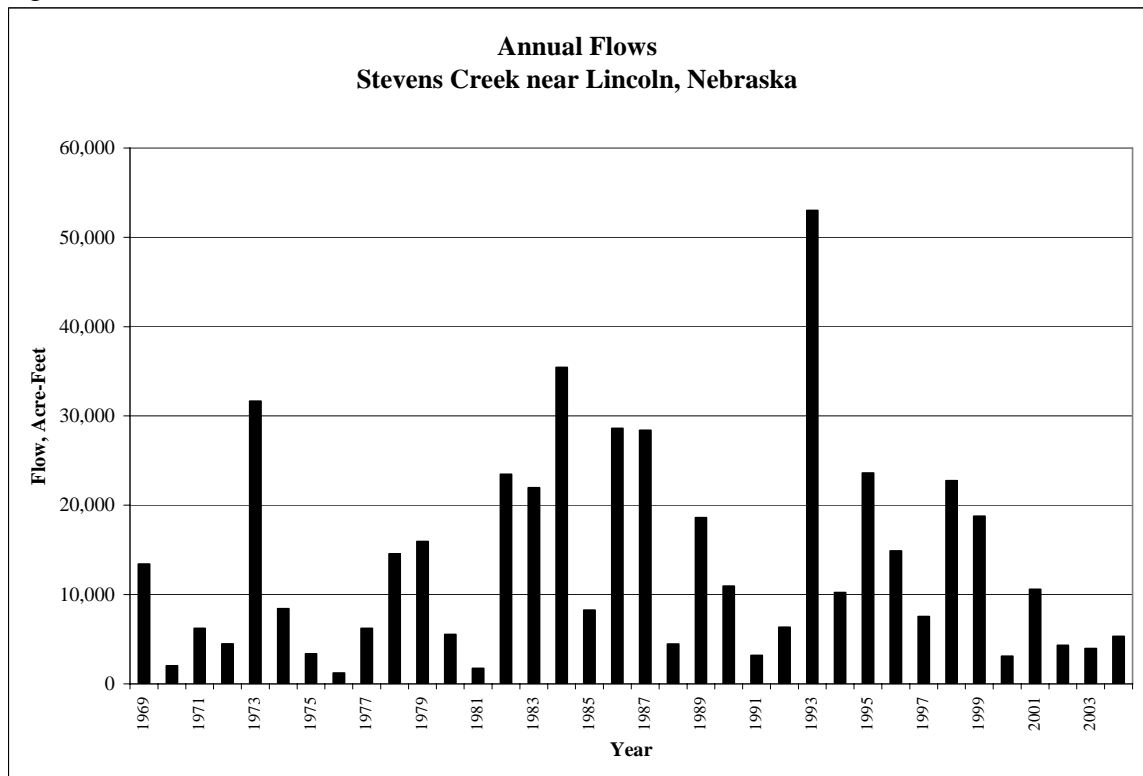


Figure LP-39. Annual Flows, Rock Creek near Ceresco.

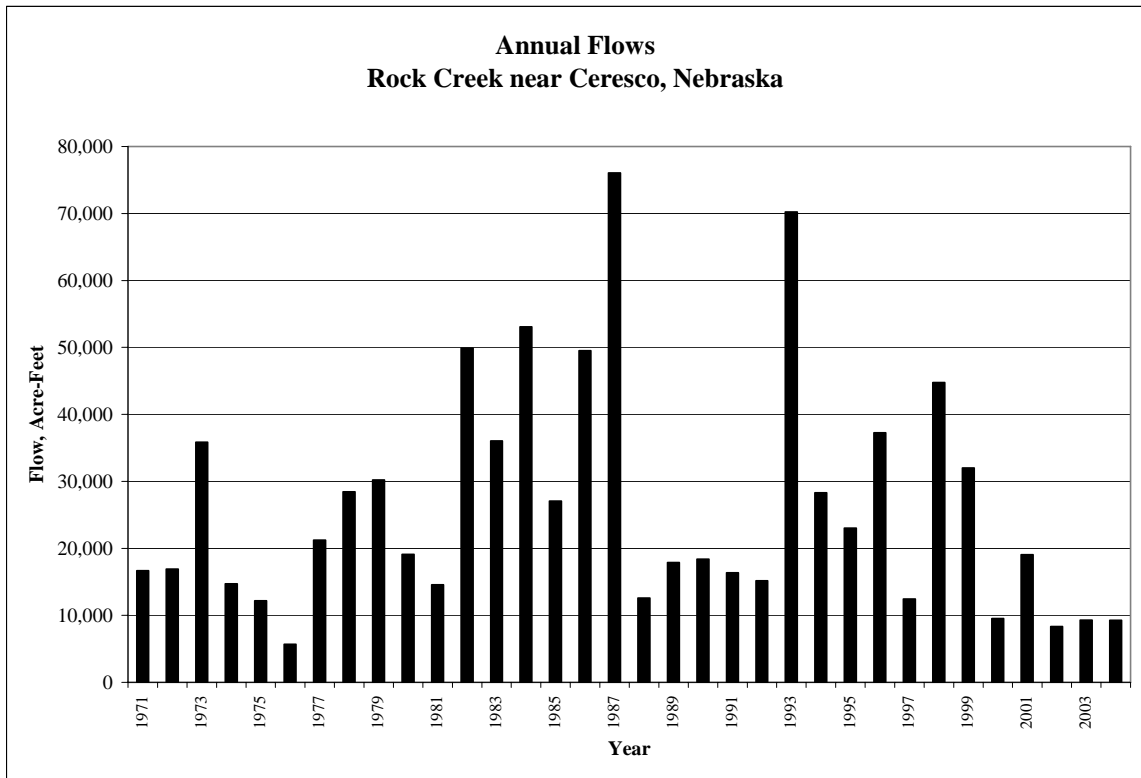


Figure LP-40. Annual Flows, Wahoo Creek at Ithaca.

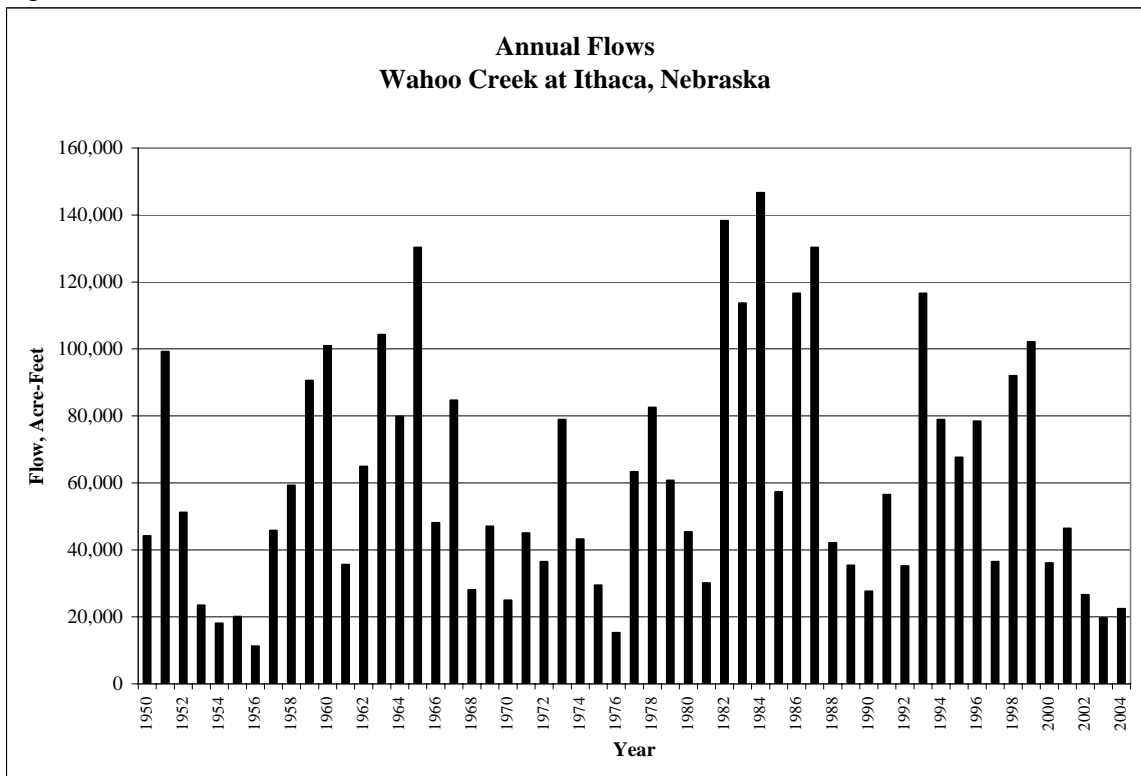


Figure LP-41. Annual Flows, Platte River at North Bend.

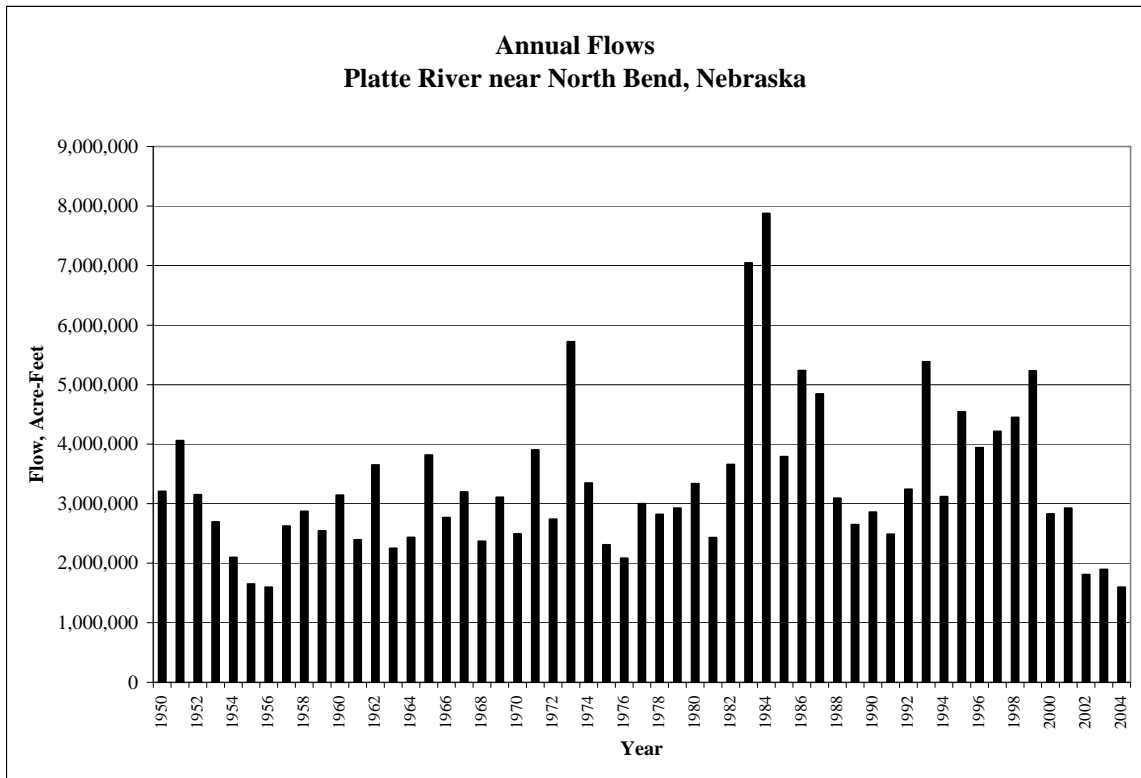


Figure LP-42. Annual Flows, Platte River near Ashland.

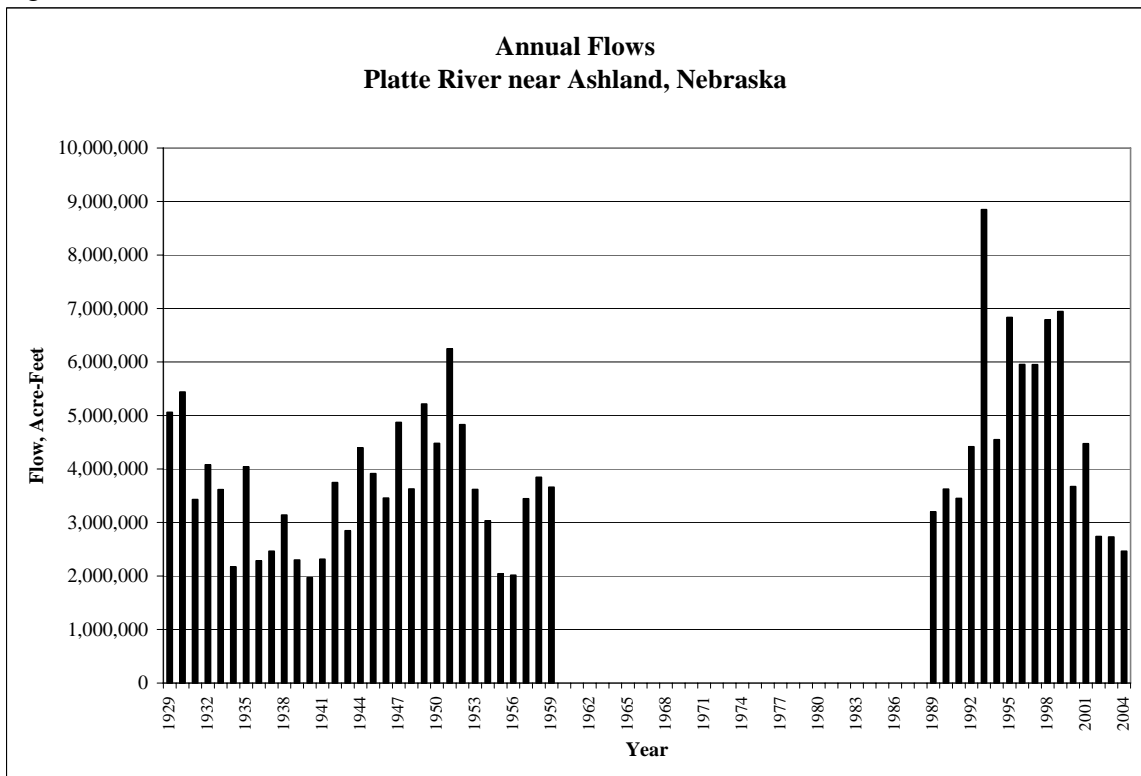
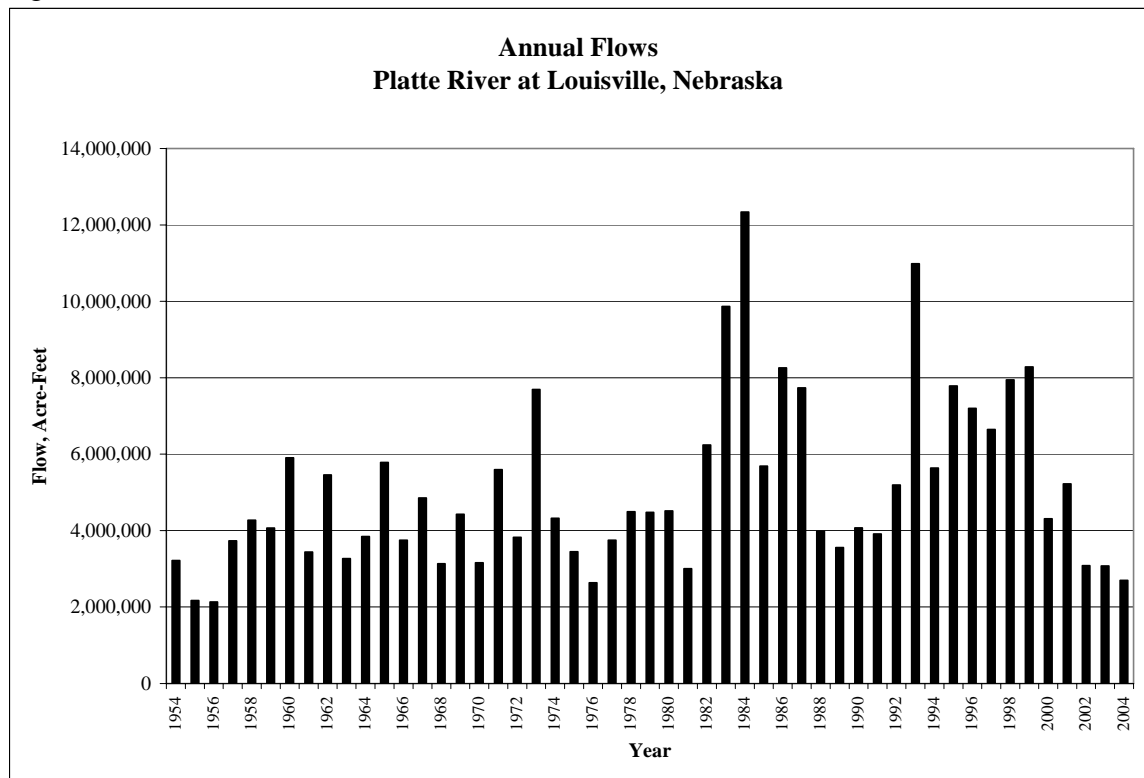


Figure LP-43. Annual Flows, Platte River at Louisville.



Cumulative Number of Surface Water Appropriations in Lower Platte River Basin by Use

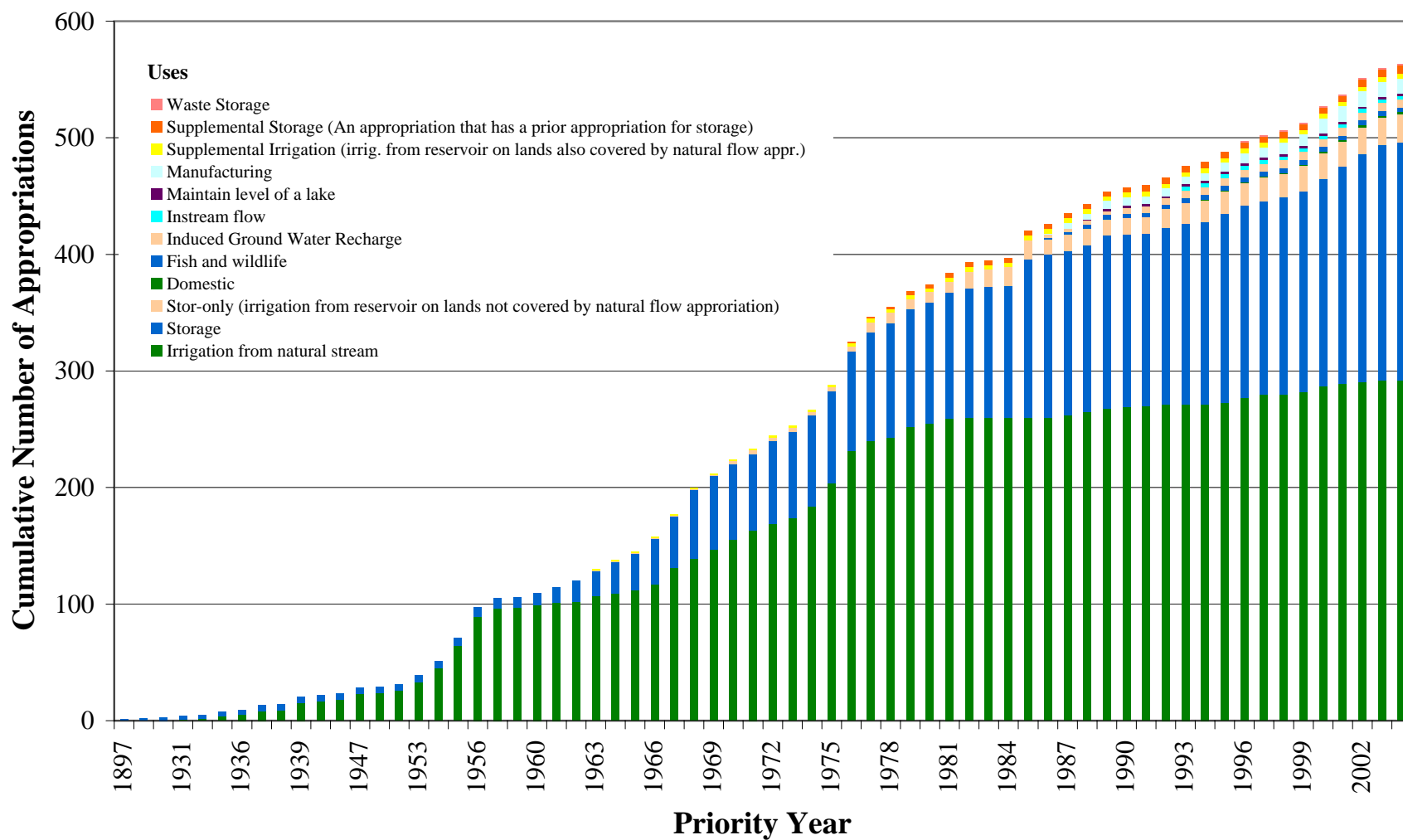


Figure LP-44

Cumulative Surface Water Appropriated Acres in Lower Platte River Basin

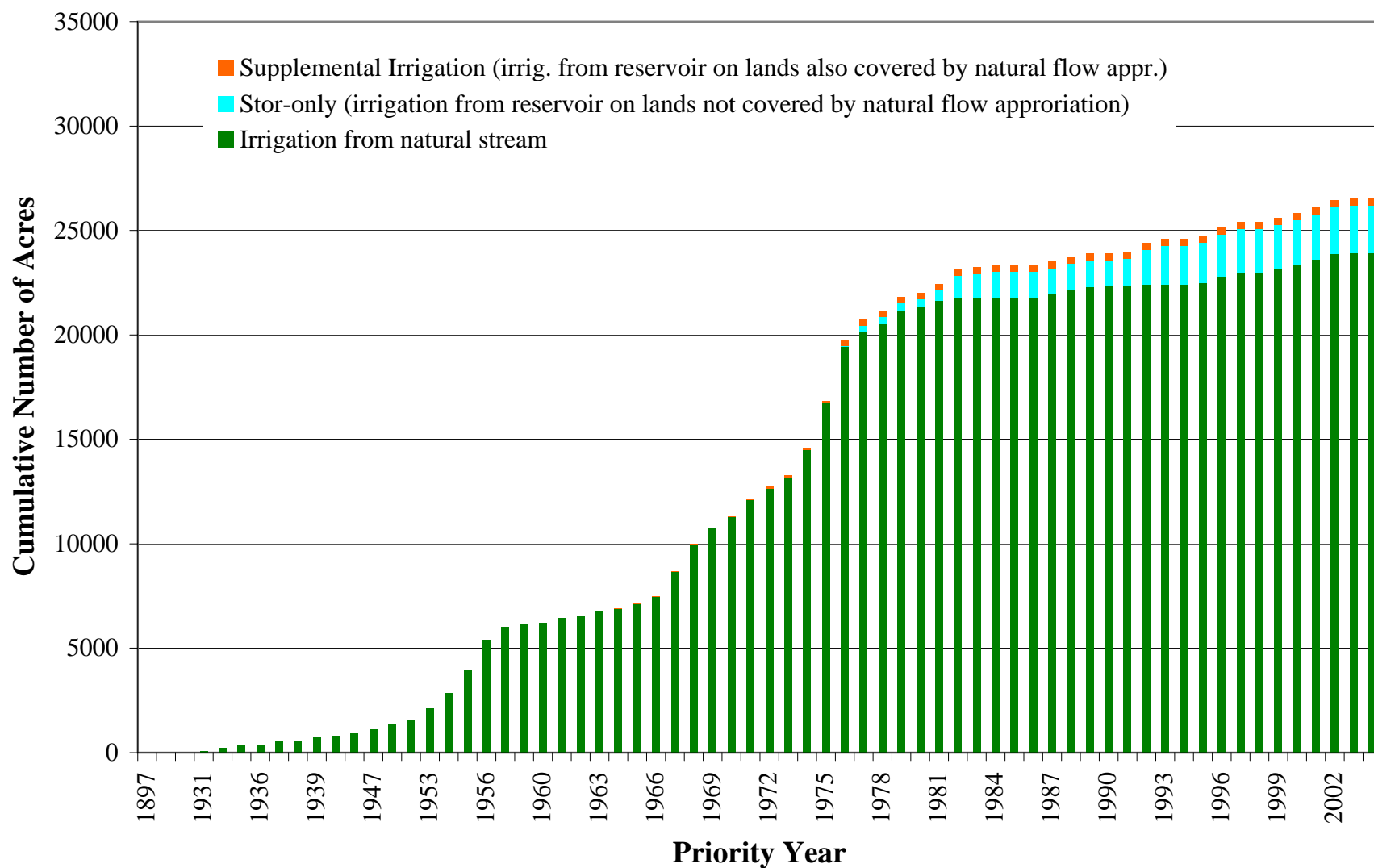
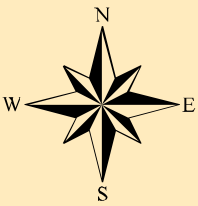


Figure LP-45



Surface Water Points of Diversion LOWER PLATTE RIVER BASIN



Planning and Assistance Division

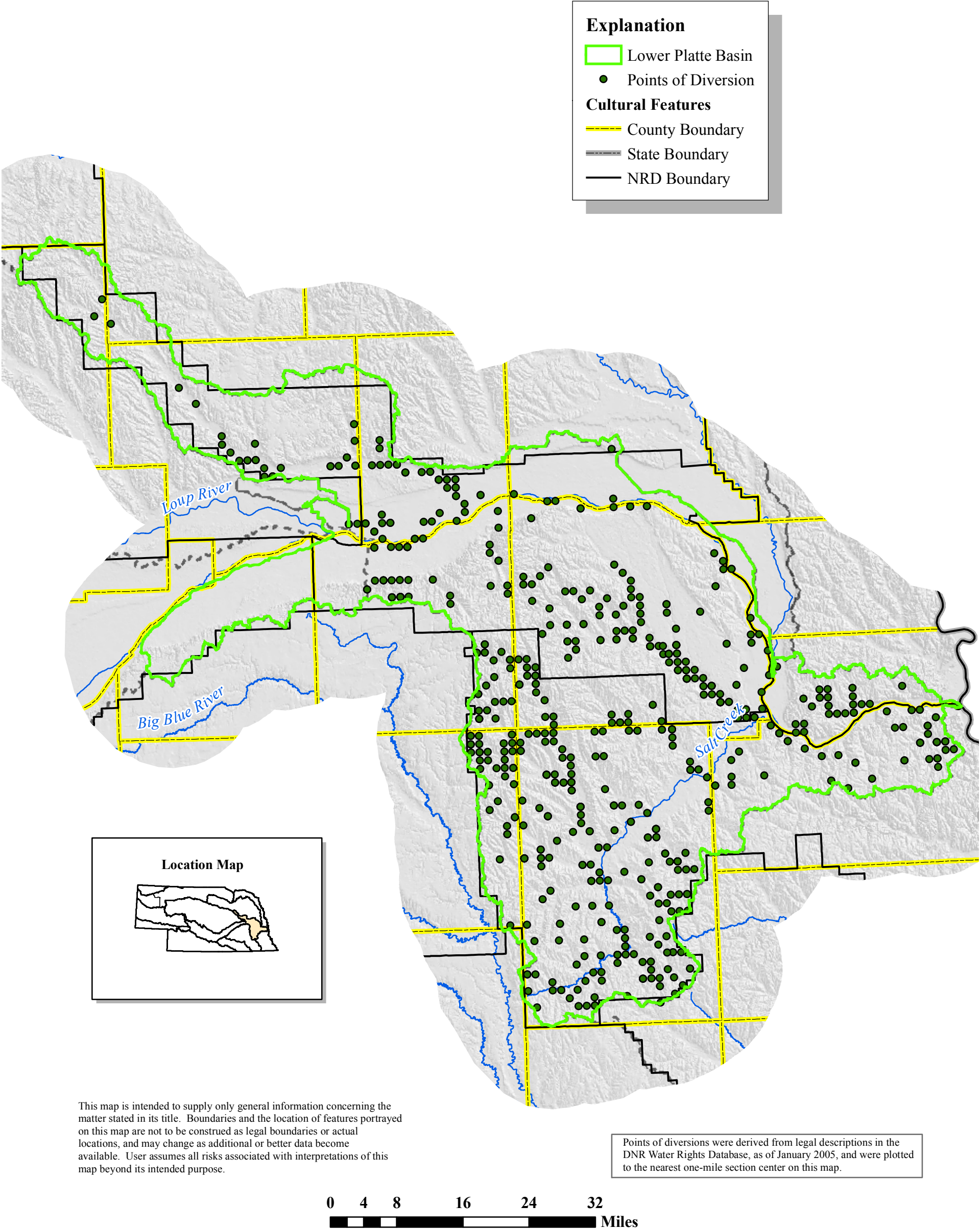


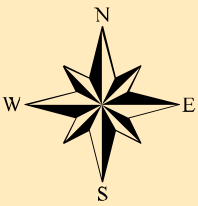
Figure LP-46.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Points of diversion map produced by Shuhai Zheng, October 11, 2005.



Corn Irrigation Requirement

LOWER PLATTE RIVER BASIN



Planning and Assistance Division

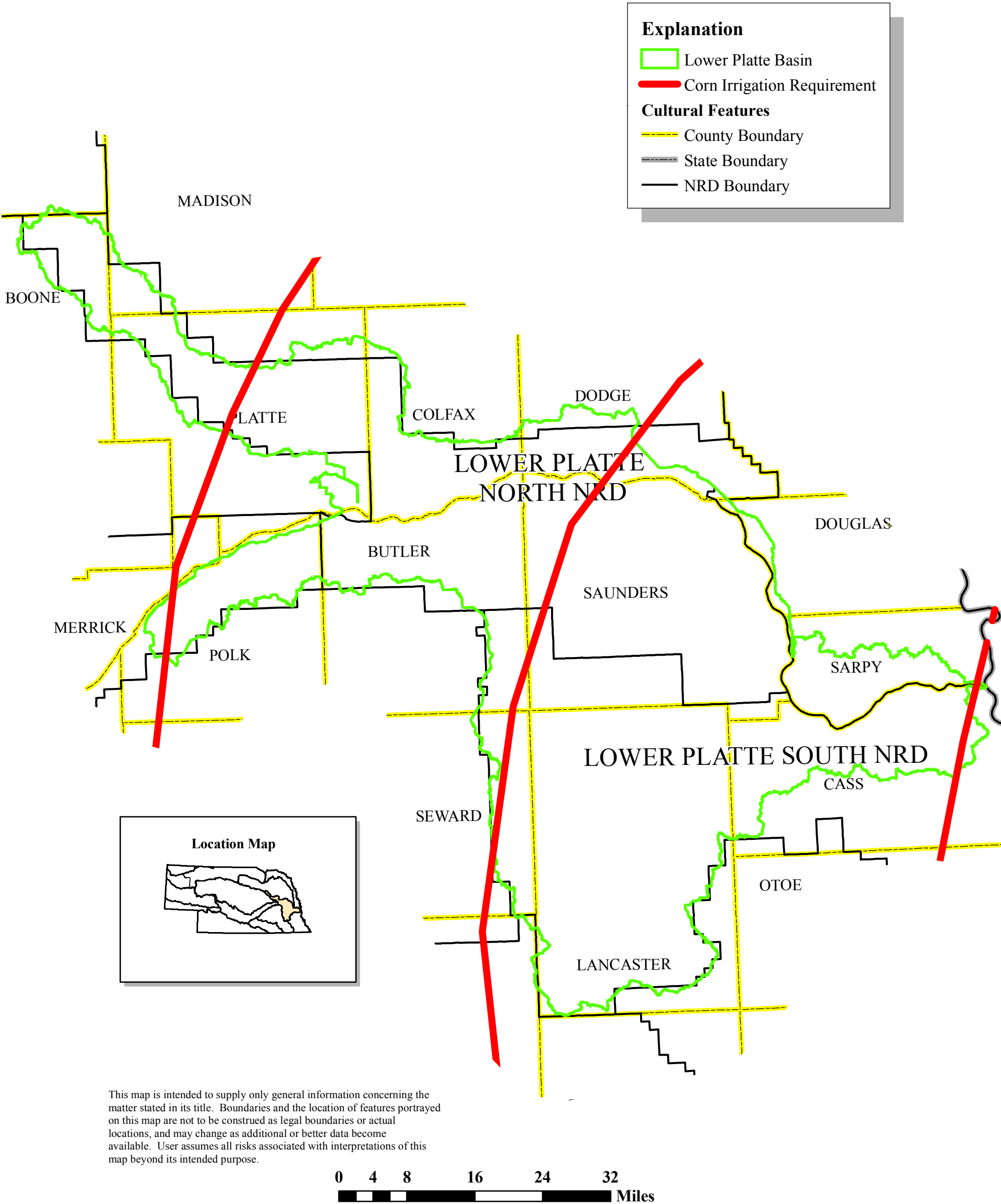
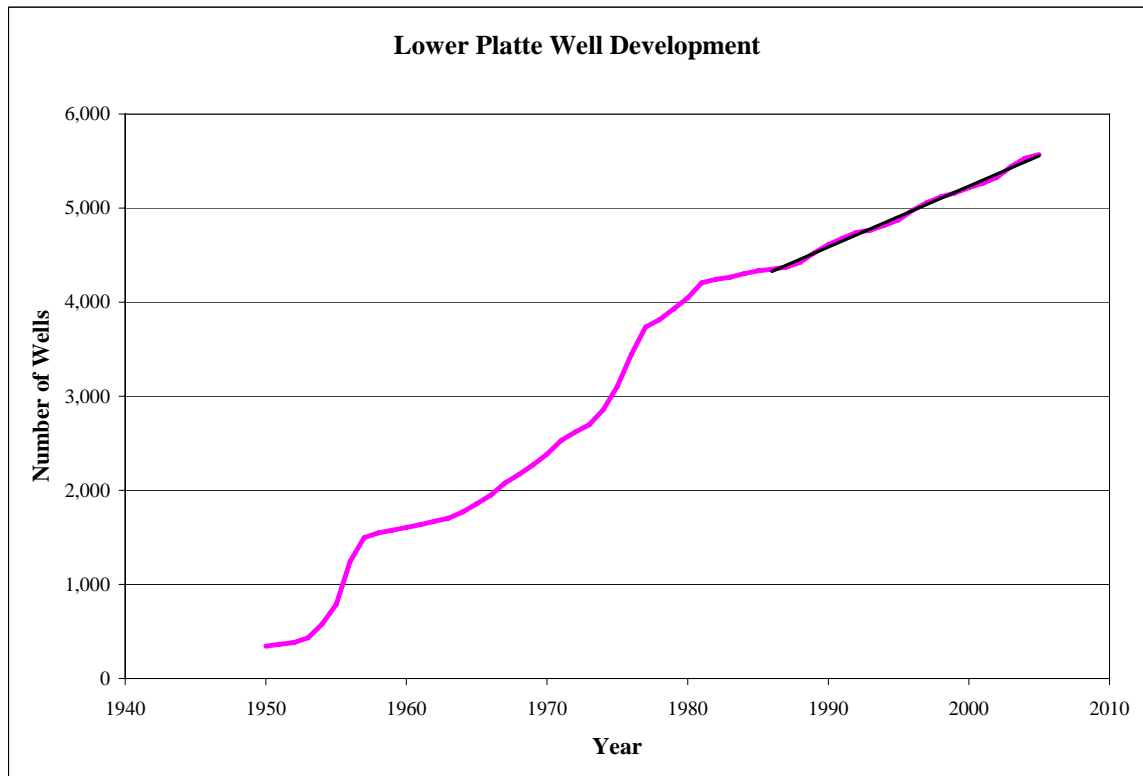


Figure LP-47.

Base map produced by Josh Lear, February 4, 2005
Base map approved February 4, 2005
Transmissivity map produced by Kevin J. Schwartman, December 7, 2005

Figure L-48 Historic High Capacity Well Development in the Lower Platte River Basin Model Area.



Bibliography of Hydrogeologic References for Lower Platte Basin

Citation Avdhesh, K.T. and Nuzman, C.E., 1980, Review of Lincoln Hydrology Study Ashland Well Field Platte River, Nebraska. August, 1980: Hydrology Division Layne-Western Company, Inc/Mission, Kansas, 22 pages.

Citation Ayers, J. A. 1989. Hydrogeology of the Lower Platte Valley Alluvial Aquifer (OFR-41). 118 pp. + 2 over-sized maps.

Citation Ayers, J. F. 1990. Hydrogeology of the Lower Platte Valley Alluvial Aquifer, Part II: Groundwater Flow Model Update (OFR-43). 242 pp.

Citation Barnes, I., Bentall, R. 1968. Water-Mineral Relations of Quaternary Deposits in the Lower Platte River Drainage Area in Eastern Nebraska (WSP-1859-D). 39 pp.

Citation Bentall, R.& Hamer, T., 1980, Stream-Aquifer Relationships in Nebraska: UNL Conservation and Survey Division and Nebraska Department of Water Resources, 102 pages, 171 illustrations.

Citation Bisbee, M., 1997, Geology, soils and the potential for further migration into the groundwater of hazardous material from the University of Nebraska Agricultural Field Laboratory in Saunders County, Nebraska: Thesis (M.S.)--University of Nebraska--Lincoln, 1997

Citation Bliss, Q.P., and Schainost, S., 1973, Lower Platte Basin stream inventory report: Lincoln, Neb.?] : Nebraska Game and Parks Commission, Bureau of Wildlife Services, Aquatic Wildlife Division, 1973, 13 p.

Citation Boochar, J.A., and Provaznik, Mary Kay, 1996, Peak flows for the period of record for current and discontinued streamflow stations in Nebraska: U.S. Geological Survey Open-File Report 96-101, 518 p.

Citation Brown, D.W., 1955, Ground-water resources of the Middle Loup division of the lower Platte River basin, Nebraska: U.S. Geological Survey Water-Supply Paper 1258, 85 p.

Citation Brugger, W.E., 1968, Groundwater Recharge in a Platte Valley Wellfield: M.S Thesis, University of Nebraska-Lincoln Department of Civil Engineering, June, 1968.

Citation Burchett, R.R., Reed, E. C., 1967. Centennial Guidebook to the Geology of Southeastern Nebraska, University of Nebraska Conservation and Survey Division, Lincoln Nebraska Geological Survey, May, 1967, 83 pp

Citation Burchett, R.R., Guideboon to the Geology Along the Missouri River Bluffs of Southeastern Nebraska and Adjacent Areas: UNL Conservation and Survey Division, April 1970, 23 pages.

Citation Burchett, R.R., 1971, Guidebook to the geology along portions of the lower Platte River Valley and Weeping Water Valley of Eastern Nebraska: University of Nebraska, Conservation and Survey Division, April 1971, 39 P.

Citation Carlson, M.P., 1993, Geology, Geologic Time and Nebraska: Conservation and Survey Division Educational Circular No. 10, August 1993, 60 pages.

Citation Channel, C.B., 1901, Third Biennial Report of the State Engineer, Secretary of the State Board of Irrigaion to the Governor of Nebraska 1899 abd 1900: Hunter Woodruff Printing Co. Lincoln, Nebraska, 220 pages.

Citation Chen, X.H., 2005, Statistical and Geostatistical Features of Streambed Hydraulic Conductivities in the Platte River, Nebraska, Environmental Geology (In Review).

Citation Davis, R.K., 1986, Hydrogeologic interrelations of the Platte River Basin and the Upper Big Blue River Basin, in the Polk County area of Nebraska: Thesis (M.S.)--University of Nebraska--Lincoln, 1986.

Citation Docekal, J., 1959, Topography and geology of the Pennsylvanian surface in parts of Douglas, Sarpy, Cass, and Washington Counties, Nebraska: University of Nebraska (Lincoln campus) Thesis : Department of Geology.

Citation Druliner, A.D., Chen, A.H., and Hull, S.H., 1997, The chemical quality of overbank sediment deposited by the 1993 floods and streambed sediment in major streams at selected sites in eastern Nebraska: U.S. Geological Survey Open-File Report 96-419, 57 p.

Citation Druliner, A.D., and Mason, J.P., 2001, Hydrogeology and water quality of five principal aquifers in the Lower Platte South Natural Resources District, eastern Nebraska, 1994: U.S. Geological Survey Water-Resources Investigations Report 00-4155, 45 p., <http://pubs.water.usgs.gov/wri004155/>

Citation Dugan, J. T., 1984, Hydrologic characteristics of Nebraska soils: U.S. Geological Survey Water-Supply Paper 2222, 19 p., 12 pls.

Citation Dugan, J.T., and Zelt, R.B., 2000, Simulation and analysis of soil-water conditions in the Great Plains and adjacent areas, central United States, 1951-80: U.S. Geological Survey Water-Supply Paper 2427, 81 p.

Citation Edwards, E.L., 1919, Stratigraphy of the Pennsylvanian divisions of the lower Platte Valley of Nebraska: Thesis (M.A.)--University of Nebraska (Lincoln campus),1919.

Citation Ellis, M.J., Engberg, R.A., Kastner, W.M., and Steele, E.K., Jr., 1985, Nebraska ground-water resources, in National Water Summary 1984-hydrologic events, selected water-quality trends, and ground-water resources: U.S. Geological Survey Water-Supply Paper 2275, p. 291-296.

Citation Ellis, M.J., 1986, Hydrogeologic data for the Dakota aquifer system in Nebraska: U.S. Geological Survey Open-File Report 86-526, 100 p.

Citation Fischer, B.C., Kollasch, K.M., and McGuire, V.L., 2000, Digital data set of water-level changes in the High Plains aquifer in parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming, 1980 to 1997: U.S. Geological Survey Open-File Report 00-96, (<http://water.usgs.gov/lookup/getspatial?OFR0096>).

Citation Frankforter, J.D., and Emmons, P.J., 1997, Potential effects of large floods on the transport of atrazine into the alluvial aquifer adjacent to the Lower Platte River, Nebraska: U.S. Geological Survey Water-Resources Investigations Report 96-4272, 17 p.

Citation Goll, C.L., 1961, The geology of Seward County, Nebraska: Thesis (M.S.)--University of Nebraska (Lincoln campus), 1961

Citation Goodenkauf, O., and Holly, D.E., 1990, Groundwater quality in Lancaster County, Nebraska / compiled by the Lincoln-Lancaster County Planning Dept

Citation Gosselin, D. C., Headrick, J., Chen, X-H., Summerside, S. E., 1996. Regional Hydrogeologic Summaries from Domestic Well-water Quality in Rural Nebraska -- Southeastern Glacial Drift Area (GIM-99): 4 pp.

Citation Gosselin, D. C., Headrick, J., Chen, X-H., Summerside, S. E., 1996. Regional Analysis of Rural Domestic Well-water Quality -- Southeastern Glacial Drift Area (GIM-112): 11 pp.

Citation Harden, R.W., 1959, A structural investigation in Sarpy County, Nebraska, and certain adjacent areas: Thesis (M.S.)--University of Nebraska (Lincoln campus),1959.

Citation Hedman, E. R., Engel, Glenn B., 1989, Flow characteristics for selected streams in the Great Plains subregion of the central midwest regional aquifer system and selected adjacent areas--Kansas and Nebraska, and parts of Colorado, Iowa, Missouri, New Mexico, Oklahoma, South Dakota, Texas and Wyoming: Hydrologic Atlas 708.

Citation Hedman, E.R. and Jorgensen, D.G., 1990, Surface- and Ground-Water Interaction and Hydrologic Budget of the Missouri River Valley Aquifer Between Yankton, South Dakota, and St. Louis, Missouri: U.S. Geological Survey Hydrologic Investigations Atlas HA-721.

Citation Heimes, F.J., and Luckey, R.R., 1980, Evaluating methods for determining water use in the High Plains in parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming, 1979: U.S. Geological Survey Water-Resources Investigations Report 80-111, 118 p.

Citation Heimes, F.J., and Luckey, R.R., 1982, Method for estimating historical irrigation requirements from ground water in the High Plains aquifer in parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming: U.S. Geological Survey Water-Resources Investigations Report 82-40, 64 p.

Citation Heimes, F.J., and Luckey, R.R., 1983, Estimating 1980 ground-water pumpage for irrigation on the High Plains in parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming: U.S. Geological Survey Water-Resources Investigations Report 83-4123, 36 p.

Citation Helgesen, J.O., Leonard, R.B., and Wolf, R.J., 1993, Hydrology of the Great Plains Aquifer System in Nebraska, Colorado, Kansas, and Aduacent Areas: U.S. Geological Survey Professional Paper 1414-E, 80 pages, 10 plates (photocopy).

Citation Holly, D.E., 1980, Hydrogeology of northern Lancaster County, Nebraska: Thesis (M.S.)--University of Nebraska--Lincoln, 1980

Citation Hyland, J.B., Keech, C.F., and Rosene, P.G., 1964, Ground water in Cedar Rapids Division of Lower Platte River basin, Nebraska: U.S. Geological Survey Water-Supply Paper 1779-H, 12 p.

Citation Joeckel, R. M., and others. 2001. Dakota Formation (Cretaceous, Albion) Fluvial to Estuarine Sediments in the Lowermost Platte Valley, Nebraska (OFR-61). 52 pp.

Citation Johnson, W.R., 1931, Some Plattsmouth microfossils from the Synderville quarry, Cass county, Nebraska: University of Nebraska (Lincoln campus) Thesis : Department of Geology.

Citation Johnson, S.M. and Swanson, R.B., 1994, Operational Procedures for Collecting Water-Quality Samples at Monitoring Sites on Maple Crddk Near Nickerson and the Platte River at Louisville, Eastern Nebraska: U.S. Geological Survey Open-File Report 94-121, 24 pages

Citation Keech, C.F., 1952, Ground-water Resources of the Wood River Unit of the Lower Platte River Basin Nebraska (Circ-139).

Citation Keech, C.F., 1957, Water levels in observation wells in Nebraska during 1956: U.S. Geological Survey Open File Report 57-61,123p.

Citation Keech, C.F., 1962, Geology and hydrology of the site in the Hallam Nuclear Power Facility, Nebraska: USGS Bulletin 1133-B, p. B1-B51.

Citation Keech, C.F., 1972, Ground water in Polk County, Nebraska: U.S. Geological Survey Hydrologic Atlas 389, 1 map.

Citation Kister, L.R. and Mundorff, J.C., 1963, Sedimentation and Chemical Quality of Water in Salt Creek Basin Nebraska, Contributions to the Hydrology of the United States: U.S. Geological Survey Water-Supply Paper 1669-H, 47 pages

Citation Krecyk, K.A., 1969, A Medial Pleistocene faunal assemblage from Saunders county, Nebraska: Thesis (M.S.)--University of Nebraska (Lincoln campus),1969.

Citation Lichtler, W.F., Stannard, D.I., and Kouma, E., 1980, Investigation of artificial recharge of aquifers in Nebraska: U.S. Geological Survey Open-File Report 80-93, 112 p.

Citation Lower Platte South Natural Resources District, 1994, Groundwater Management Plan, June 1994,

Citation Lueninghoener, G.C., 1947, The post-Kansan geologic history of the lower Platte Valley area: Lincoln, Neb., The University, 1947, 82 p.

Citation Mandel, R.D., and Bettis, E.A. III, 2001. Late Quaternary Landscape Evolution in the South Fork of the Big Nemaha River Valley, Southeastern Nebraska and Northeastern Kansas (GB-11): In conjunction with Midwest Friends of the Pleistocene 47th Field Conference - June 2-4, 2000, Hiawatha, Kansas, 58 pp.,

Citation Marlette, R.R., 1968, Ground Water Resources of Lower Platte Valley, A Report on Effects of Lower Platte River Dam on Minicipal Water Supplies for: U.S. Army Corps of Engineers Omaha District, 25 pages plus Appendix.

Citation Marlette, R.R., and Brogden, R.E., 1971, Ground water resources of the lower Platte River Valley: Lincoln : Univ. of Nebraska, Dept. of Civil Engineering, 1971

Citation McGuire, V.L., and Sharpe, J.B., 1997, Water-level changes in the High Plains aquifer, 1980 to 1995: U.S. Geological Survey Fact Sheet FS-068-97, 4 p., http://www-ne.cr.usgs.gov/highplains/hpfs95_txt.html http://www-ne.cr.usgs.gov/highplains/hpfs95_txt.html

Citation McGuire, V.L., and Fischer, B.C., 1999, Water-level changes, 1980 to 1997, and saturated thickness, 1996 97, in the High Plains aquifer: U.S. Geological Survey Fact Sheet FS-124-99, 4 p., http://www-ne.cr.usgs.gov/highplains/hp97_web_report/fs-124-99.htm

Citation McGuire, V.L., 2001, Water-level changes in the High Plains aquifer, 1980 to 1999: U.S. Geological Survey Fact Sheet FS-029-01, 2 p.

Citation McGuire, V.L., Johnson, M.R., Schieffer, R.L., Stanton, J.S., Sebree, S.K., and Verstraeten, I.M., 2003, Water in storage and approaches to ground-water management, High Plains aquifer, 2000: U.S. Geological Survey Circular 1243, 51 p., <http://pubs.water.usgs.gov/circ1243>

Citation McGuire, V.L., 2003, Water-level changes in the High Plains aquifer, predevelopment to 2001, 1999 to 2000, and 2000 to 2001: U.S. Geological Survey Fact Sheet 078-03, 4 p. <http://water.usgs.gov/pubs/fs/FS078-03/>

Citation McGuire, V.L., 2004, Water-level changes in the High Plains aquifer, predevelopment to 2002, 1980 to 2002, and 2001 to 2002: U.S. Geological Survey Fact Sheet 2004-3026, 6 p., <http://water.usgs.gov/pubs/fs/2004/3026/>

Citation McLean, J.S., Chen, H.H., and Goeke, J.W., 1997, Simulation of ground-water flow in the High Plains aquifer, southern sandhills area, west-central Nebraska: U.S. Geological Survey Open-File Report 96 206, 16 p.

Citation Mechling, G.W., 1931, Geology and water resources of Lancaster County: Thesis (M.S.)--University of Nebraska (Lincoln campus)

Citation Miller, J.A., and Appel, C.L., 1997, Ground water atlas of the United States—Segment 3, Kansas, Missouri, Nebraska: U.S. Geological Survey Hydrologic Atlas HA 730-D, 24 p.

Citation Nebraska Department of Natural Resources, 2004, Irrigation and Reclamation Districts and Water Delivery Companies, September 2004, 32 pages.

Citation Nebraska Game and Parks Commission, 1983, NEBRASKAland Magazine's Nebraska Rivers: Published by the Nebraska Game and Parks Commission, Vol. 61, No. 1, January-February 1983, 146 pages.

Citation Nebraska Natural Resources Commission, 1973, Salt Creek Basin: Lincoln metropolitan area water quality management plan. Prepared jointly by City of Lincoln, Nebraska Natural Resources Commission [and] Lower Platte South Natural Resources District: [Lincoln, Nebr.] 1973, 237 p.

Citation Nebraska Natural Resources Commission, 1973, Appendices to Salt Creek Basin: Lincoln metropolitan area water quality management plan. June, 1973.

Citation Nebraska Natural Resources Commission, 1974, Lower Platte River Basin Water Quality Management Plan: Prepared by Nebraska Natural Resources Commission for implementation by Nebraska Department of Environmental Control in Cooperation with the Nebraska State Office of Planning and Programming, June, 1974.

Citation Nebraska Natural Resources Commission, 1986, Policy Issue Study on Integrated Management of Surface Water and Groundwater, State Water Planning and Review Process Nebraska Natural Resources Commission, April 1986, 139 pages.

Citation Nebraska Natural Resources Commission, 1998, Estimated Water Use In Nebraska, 1995: Prepared in Cooperation with the U.S. Geological Survey, April 1998, 64 pages.

Citation Nebraska Water Resources Center University of Nebraska-Lincoln, 1982, Water Resources Publications Related to the State of Nebraska, Fifth Edition, NWRC Publication No. 7, 165 pages.

Citation Nelson, H.R., 1958, A structural investigation in eastern Cass county and northeastern Otoe county, Nebraska: Thesis (M.S.)--University of Nebraska (Lincoln campus).

Citation Nemaha Natural Resources District, 1985, Groundwater Management Plan, 148 pages.

Citation Nuzman, C.E., 1974, Lincoln Hydrology Study Ashland Well Field Platte River, Nebraska. June, 1974: Hydrology Division Layne-Western Company, Inc/Omaha, Nebraska, 43 pages.

Citation Pabian, R.K., 2001, Geology of Pioneers Park, Lancaster County, Nebraska: Conservation and Survey Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, [2001], 19 p.

Citation Peters, E.J., 1989, Platte River suitability criteria : habitat utilization, preference and suitability index criteria for fish and aquatic invertebrates in the Lower Platte River: Lincoln, Neb. : Nebraska Game and Parks Commission, 1989, 135 p.

Citation Pettijohn, R.A., and Chen, H.H., 1983a, Geohydrology of the High Plains aquifer system in Nebraska: U.S. Geological Survey Open-File Report 82-502, scale 1:175,000, 3 sheets.

Citation Pettijohn, R.A., and Engberg, R.A., 1985, Water quality variations in Antelope Creek and Deadmans Run, Lincoln, Nebraska: U.S. Geological Survey Water-Resources Investigations Report 85-4153, 36 p.

Citation Reed, E.C. and Dreeszen, V.H., 1965, Revision of the Classification of the Pleistocene Deposits of Nebraska: Nebraska Geological Survey Bulletin, No. 23 June 1965, Published by the University of Nebraska Conservation and Survey Division, 65 pages.

Citation Shaffer, F.B., 1972, Characteristics of streamflow at gaging stations in Shell Creek, Elkhorn River, and Salt Creek basin, Nebraska: U.S. Geological Survey Open-File Report 71-253, 73 p.

Citation Sniegocki, R.T., 1955, Ground-water resources of the Priarie Creek unit of the lower Platte River basin, Nebraska: U.S. Geological Survey Water-Supply Paper 1327, 133 p.

Citation Snook, V.A., 2001, Movements and habitat use by hatchery-reared pallid sturgeon in the lower Platte River, Nebraska: Thesis (M.S.)--University of Nebraska--Lincoln, 2001

Citation Soenksen, P.J., Turner, M.J., Dietsch, B.J., and Simon, Andrew, 2004, Stream bank stability in eastern Nebraska: U.S. Geological Survey Water-Resources Investigations Report 03-4265, 96 p., 1 CD-ROM, available at URL: <http://water.usgs.gov/pubs/wri/wri034265/>

Citation Souders, V.L., 1967, Availability of Water in Eastern Sounders County Nebraska: U.S. Geological Survey Hydrologic Atlas HA-266.

Citation Souders, V. L., and Shaffer, F. B., 1969, Water resources of Antelope County, Nebraska: U.S. Geological Survey Hydrologic Investigations Atlas HA-316, 5 maps on 3 sheets

Citation Souders, V. L., Jess, J. M., Reed, E. C. 1969. Progress Report, Lower Platte Basin Study, November 12, 1969 (OFR-4). 5 pp.

Citation Sounders, V.L., 1967, Availability of water in eastern Saunders County, Nebraska: U.S. Geological Survey Hydrologic Atlas 266, 3 maps.

Citation Stanton, J.S., 2000, Areas of gain and loss along the Platte River, central Nebraska, spring 1999: U.S. Geological Survey Water-Resources Investigations Report 00-4065, 1 sheet.

Citation Steele, G.V., and Verstraeten, I.M., 1999, Effects of pumping collector wells on river-aquifer interaction at Platte River Island near Ashland, Nebraska, 1998: U.S. Geological Survey Water-Resources Investigations Report 99-4161, 6 p.

Citation Steele, G.V., 2002, Age of ground water at City of Lincoln's municipal well field near Ashland, Nebraska: U.S. Geological Survey Fact Sheet 091-02, 6 p.

Citation Stoesz, L.W., 1949, A sedimentation study of early pleistocene intertill deposits in northwestern Lancaster county, Nebraska: Thesis (M.S.)--University of Nebraska (Lincoln campus)—1949

Citation Swigle, B.D., 2003, Movements and habitat use by shovelnose and pallid sturgeon in the lower Platte River, Nebraska: Thesis (M.S.)--University of Nebraska--Lincoln, 2003

Citation Swinehart, J.B., Souders, V.L., DeGraw, H.M., and Diffendal, R.F. Jr., 1985, Cenozoic Paleogeography of Western Nebraska: Rocky Mountain Paleogeography Symposium 3, Rocky Mountain Section - S.E.P.M. Cenozoic Paleogeography of the West-Central U.S., R.M. Flores and S.S. Kaplan, Editors: Denver, CO 1985, pp 209 - 230.

Citation U.S. Army Corps of Engineers, 1966, Linwood Unit Nebraska, Reconnaissance Report: U.S. Bureau of Reclamation, Region 7 Denver Colorado, Niobrara - Lower Platte Projects Office Grand Island, Nebraska, August 1 1966.

Citation U.S. Army Corps of Engineers, 1969, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1969, 107 pages, 4 Plates.

Citation U.S. Army Corps of Engineers, 1970, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1970, 103 pages, 4 Plates.

Citation U.S. Army Corps of Engineers, 1971, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1971, 35 pages, 3 Plates.

Citation U.S. Army Corps of Engineers, 1972, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1972, 57 pages, 3 Plates.

Citation U.S. Army Corps of Engineers, 1973, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1973, 30 pages, 3 Plates.

Citation U.S. Army Corps of Engineers, 1974-1975, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1974-1975, 5 pages, 3 Plates.

Citation U.S. Army Corps of Engineers, 1976-1977, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1976-1977, 57 pages, 3 Plates.

Citation U.S. Army Corps of Engineers, 1979, Aerial Photography and Maps of the Missouri River Sioux City, Iowa to Rulo, Nebraska, 27 pages.

Citation U.S. Army Corps of Engineers, 1978-1979, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1978-1979, 62 pages, 3 Plates.

Citation U.S. Army Corps of Engineers, 1980-1981, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1980-1981, 62 pages, 3 Plates.

Citation U.S. Army Corps of Engineers, 1983, Aerial Photography and Maps of the Missouri River Ponca State Park, Nebraska to Sioux City, Iowa and Sioux City, Iowa to Rulo, 27 pages.

Citation U.S. Army Corps of Engineers, 1982-1983, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1982-1983, 62 pages, 3 Plates.

Citation U.S. Army Corps of Engineers, 1984-1985, Stages and Discharges of the Missouri River and Tributaries in the Omaha District 1984-1985, 63 pages, 3 Plates.

Citation U.S. Army Corps of Engineers, 1994, Missouri River Master Water Control Manual Volume 3A: Flow Studies Gavins Point Dam to St. Louis Missouri, 162 pages.

Citation U.S. Army Corps of Engineers, 1994, Missouri River Master Water Control Manual Volume 3B: Flow Studies Gavins Point Dam to St. Louis Missouri; Appendix A - Ice Impacts; Appendix B - Water Quality Impacts.

Citation U.S. Army Corps of Engineers, 1998, Missouri River Master Water Control Manual Volume 12B: Groundwater Study; Appendix A -Soil Boring Logs; Appendix B - Falling Head Permeability; Appendix C -Aquifer Test for Levee District L-550; Appendix D -Aquifer Test for Tri-County LD2; Appendix E - Long-Term Simulation Plots; Appendix F - Levee Unit L488/497 Calibration Tests.

Citation U.S. Army Corps of Engineers, 1998, Missouri River Master Water Control Manual Volume 12A: Groundwater Study; Main Report - RM691, L488/497, Tri-County LD2; Main Report - L575.

Citation U.S. Bureau of Reclamation, 1948, Plan of development for Lower Platte River Basin: [Denver?], 1948, 578 p.

Citation U.S. Dept. of Agriculture, 1977, Watershed plan and environmental impact statement : South Branch Little Nemaha watershed, Johnson, Lancaster, and Otoe Counties, Nebraska / prepared under the authority of the Watershed Protection and Flood Prevention Act, Public Law 83-566, as amended (16 USC 1001-1008), and in accordance with Section 102(2)(c) of the National Environmental Policy Act of 1969, Public Law 91-190, as amended (42 USC 4321 et seq) ; prepared by Nemaha Natural Resources District ... [et al.] : U.S. Dept. of Agriculture, Soil Conservation Service, 1977]

Citation U.S. Geological Survey, 1988, National water summary 1986; hydrologic events and ground-water quality: U.S. Geological Survey Water-Supply Paper 2325, 560 p.

Citation University of Nebraska-Lincoln, 1987, The decade of North American Geology. Field guides for Nebraska: University of Nebraska-Lincoln, Nebraska Geological Survey, Conservation and Survey Division, IANR, the Department of Geology and the Nebraska State Museum, 42 p.

Citation UNL Conservation and Survey Division, 1998, The Groundwater Atlas of Nebraska: UNL Conservation and Survey Division, Resource Atlas No. 4a/1998 Second (revised) edition, 44 pages.

Citation Verstraeten, I.M., Atkeson, R.L., and Stanton, C.P., 1998, Selected surface-water, ground-water, and tracer data from the Elkhorn and Platte Rivers and the alluvium near Ashland, eastern Nebraska, 1991-97: U.S. Geological Survey Open-File Report 98 396, 64 p.

Citation Waite, H.A., 1948, Ground-water levels in the lower Platte River Valley, Nebraska: University of Nebraska, Conservation and Survey Division Nebraska Water Survey Paper Number 3, May 1948, 11pages, 1 plate.

Citation Waite, H. A. 1949. Progress Report on the Geology and Ground-Water Hydrology of the Lower Platte River Valley, Nebraska (Circ-20): 211 pp.

Citation Wayne, W.J., 1971, Guidebook for Field Trip on Urban Geology in Eastern Nebraska: UNL Conservation and Survey Division, Lincoln Nebraska Geologic Survey, April 1971, 15 pages.

Citation Weakly, E.C., 1966, Geology and ground-water resources of Polk county, Nebraska: Thesis (M.S.)--University of Nebraska (Lincoln campus),1966

Citation Weeks, J.B., and Gutentag, E.D., 1981, Bedrock geology, altitude of base, and 1980 saturated thickness of the High Plains aquifer in parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming: U.S. Geological Survey Hydrologic Investigations Atlas HA-648, scale 1:2,500,000, 2 sheets.

Citation Weeks, J.B., Gutentag, E.D., Heimes, F.J., and Luckey, R.R., 1988, Summary of the High Plains regional aquifer system-System analysis in parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming: U.S. Geological Survey Professional Paper 1400-A, 30 p.

Citation Wen, F.J., Chen, X.H., 2005, Streamflow Trends and Depletion Study in Nebraska - With a Focus on the Republican River Basin, Water Resources Research (In Review).

Citation White, K.D., and Kay, R.L., 1996, Ice jam flooding and mitigation : Lower Platte River Basin, Nebraska: Hanover, N.H. : U.S. Army Cold Regions Research and Engineering Laboratory, [1996], 88 p.

Citation Winter, T.C., Harvey, J.W., Franke, O.L. and Alley, W.M., 1998, Ground water and surface water; a single resource: U.S. Geological Survey Circular 1139, 79p